Appendix C Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

EIA Ref. (Register No. AEIAR-145/2009)	EM&A Ref./ Log Ref.	EP Condition	Recommended Mitigation Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Air Quality		
S5.5.6.1	A1	-	▪ The Contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites / Duration of the construction stage	I
S5.5.6.2	A2	-	▪ Proper watering of exposed spoil should be undertaken throughout the construction phase: ▪ Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; ▪ Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; ▪ Stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones; ▪ The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; ▪ Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; ▪ When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; ▪ The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; ▪ Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; ▪ Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; ▪ Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; ▪ Any skip hoist for material transport should be totally enclosed by impervious sheeting; ▪ Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;	All construction sites / Duration of the construction stage	I

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			▪ Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high-level alarm which is interlocked with the material filling line and no overfilling is allowed; ▪ Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and ▪ Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.		
S5.5.6.3	A3	Section 2.6 of FEP	▪ The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) within the Project site and associated work area throughout the construction phase.	All construction sites / Duration of the construction stage	I
S5.5.6.4	A4	-	▪ AAHK to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the Contractor's attention to the relevant latest Practice Notes issued by EPD.	All construction sites / Duration of the design stage	I
			Construction Noise (Airborne)		
S6.4.10	N1	-	1) Use of good site practices to limit noise emissions by considering the following: ▪ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; ▪ Machines and plant (such as trucks, cranes) 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, where possible, be orientated so that the noise is directed away from nearby NSRs; ▪ Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; ▪ Mobile plant should be sited as far away from NSRs as possible and practicable; and ▪ Material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	All construction sites / Duration of the construction stage	I
S6.4.11	N2	-	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	All construction sites / Duration of the construction stage	I (Water barriers with wire mesh installed on top are provided as hoarding according to Hoarding plan for Pier Construction.)

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S6.4.12	N3	-	3) Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	All construction sites, for plant items listed in Appendix 6D of the EIA Report / Duration of the construction stage	N/A (As informed by the Contractor, after conducting construction noise assessment for worst case scenario, no adverse construction noise impact is anticipated at the nearest NSRs, therefore adoption of movable noise barrier is considered not applicable.)
S6.4.13	N4	-	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	All construction sites, for plant items listed in Appendix 6D of the EIA Report / Duration of the construction stage	I
S6.4.14	N5	-	5) Sequencing operation of construction plants where practicable.	All construction sites / Duration of the construction stage	I
			Sediment		
-	S6.1	-	▪ Marine sediments excavated are to be treated using cement/solidification/stabilization techniques and tested against TCLP which were recommended in the EPD's Practice Guide for Investigation and Remediation of Contaminated Land. Properly treated marine sediment is to be reused onsite or offsite for backfilling and/or landscaping such that the need for offsite disposal is avoided as far as practicable.	All construction sites / Duration of the construction stage	N/A (Based on the contractor's additional information, material excavated from bored piles foundation works was not classified as marine sediment.)
			Waste Management (Construction Waste)		

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S8.3.8	WM1	-	*Construction and Demolition (C&D) Material* The following mitigation measures should be implemented in handling the waste: ▪ Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; ▪ Carry out on-site sorting; ▪ Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; ▪ Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; ▪ Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials is properly documented and verified; ▪ Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction; and ▪ Disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation.	All construction sites / Duration of the construction stage	I
S8.3.9 - S8.3.11	WM2	-	*C&D Waste* ▪ Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage; and ▪ The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	All construction sites / Duration of the construction stage	I
S8.2.12 - S8.3.15	WM3	-	*Chemical Waste* ▪ Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes; ▪ Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation; ▪ The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to	All construction sites / Duration of the construction stage	I

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			accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated; and ▪ Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.		
S8.3.16	WM4	-	*Sewage* ▪ Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites / Duration of the construction stage	I
S8.3.17	WM5	-	*General Refuse* ▪ General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes; ▪ A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law; ▪ Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible; ▪ Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminium cans, plastic bottles etc., should be provided; and ▪ Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.	All construction sites / Duration of the construction stage	I
			Water Quality (Construction Phase)		
S9.11.1.3	W2	-	1) General construction activities should be governed by standard good working practice. Specific measures to be written into the works contracts should include: ▪ Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; ▪ Sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; ▪ Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks;	All construction sites / Duration of the construction stage	I

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			▪ Silt removal facilities, channels and manholes shall be maintained, and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; ▪ Temporary access roads should be surfaced with crushed stone or gravel; ▪ Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; ▪ Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; ▪ Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; ▪ Manholes (including any 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;		
S.9.11.1.7	W1	-	▪ Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system ▪ All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; ▪ Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; ▪ The section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; ▪ Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; ▪ Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for offsite disposal; ▪ The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; ▪ Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; ▪ All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and ▪ Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All construction sites / Duration of the construction stage	I
			Landscape and Visual (Detailed Design Phase)		

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S14.3.3.2	LV1	-	General design measures include: ▪ Protection measures for the trees to be retained during construction activities; ▪ Optimizing the sizes and spacing of the bridge columns; ▪ Fine-tuning the location of the bridge columns to avoid visually-sensitive locations; and ▪ Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed.	All construction sites / Duration of the design stage	C
			Landscape and Visual (Construction Phase)		
S14.3.3.3	LV2	-	<u>Mitigate both landscape and visual impacts:</u> G1. Grass-hydroseed bare soil surface and stockpile areas.	All construction sites / Duration of the construction stage	N/A (As informed by the Contractor, no bare soil surface or stockpile areas would be left exposed for reasonably long periods of time. Therefore, grass hydroseeding would not be required. However, appropriate dust suppression measures would be provided as appropriate.)
			G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic.	New planting strip and automatic irrigation system will not be added under this Project. Instead, existing irrigation system would be reinstated after the construction works if necessary.	N/A (There were no landscape works at this stage. The planting strip near the bridge was maintained by government or other external parties.)
			G11. All existing trees shall be carefully protected during construction.	All construction sites / Duration of the construction stage	I

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S14.3.3.3	LV3	-	Mitigate visual impacts: V1. Minimise time for construction activities during construction period	All construction sites / Duration of the construction stage	I
			V2. Provide screen hoarding at the portion of the project site/ works areas/ storage areas near VSRs who have close low-level views to the Project during construction.	All construction sites / Duration of the construction stage	I (Water barriers with wire mesh installed on top were provided as hoarding according to Hoarding Plan for Pier Construction.)
			Environmental Monitoring and Audit		
S15.2.2	EM1	-	An Independent Environmental Checker shall be employed as per the EM&A Manual.	All construction sites / Duration of the construction stage	I
S15.5 - S15.6	EM2	-	▪ An Environmental Team shall be employed as per the EM&A Manual. ▪ A systematic Environmental Management Plan shall be prepared to ensure effective implementation of the mitigation measures. ▪ Environmental impact monitoring shall be implemented by the Environmental Team to ensure all requirements stipulated in the EM&A Manual are fully complied.	All construction sites / Duration of the construction stage	I

Notes:

" - ": For items denoted as " - " provided under the columns of EM&A Ref. or EP Condition, environmental protection measures should be referred to the relevant paragraph(s) / table(s) in the approved EIA Report.

" I ": Implemented where applicable.

" N/A ": Not applicable to the construction works implemented during the reporting period.

" ^ ": Checked by ET through site inspection and record provided by the Contractor.

" C ": Completed.