

Landslide Preventive Works at Po Shan, Mid-levels – Natural Terrain Risk Mitigation Measures

Appendix 11.1 Implementation Schedule

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
Construction Noise Impact						
5.13, 5.24, 5.26		<p>No more than 6 drill rigs will be operating at the same time in Works Areas E and F. No more than two drill rigs could be operating in Works Area E.</p> <p>Noise insulating fabric has to be applied for drill rigs operating in Works Area E.</p> <p>A number of four air compressors will be used. Two at Works Area A and two at Works Area G.</p> <p>A number of three grouting machines will be used. One at Works Area A and two at Works Area G.</p> <p>A number of two generators will be used. One at Works Area A and one at Works Area G.</p> <p>A number of three concrete mixers will be used. One at Works Area A and two at Works Area G.</p> <p>Moveable Noise Barrier has to be applied for the concrete mixer operating in Works Area A.</p> <p>Noise Enclosures have to be applied for the air compressors, grouting machine and generator operating in Works Area A.</p>	Contractor	Works Area	Construction Phase	EIAO-TM, NCO

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Construction Air Quality Impact						
7.16		<p>Good site practice</p> <ul style="list-style-type: none"> Covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. Use of vehicle wheel and body washing facilities at the exit points of the site. Dusty activities should be re-scheduled if high-wind conditions are encountered. Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 	Contractor	Works Area	Construction Phase	EIAO-TM, APCO
Construction Water Quality Impact						
6.22		<ul style="list-style-type: none"> Provision of perimeter drains to intercept storm-runoff from outside the works area. These shall be constructed in 	Contractor	Works Area	Construction Phase	ProPECC PN 1/94 Construction

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		<p>advance of site formation works and earthworks. Earth bunds or sand bag barriers should be provided on-site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the Contractor prior to the commencement of construction.</p> <ul style="list-style-type: none"> • Sand/silt removal facilities such as sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. The detailed design of the sand/silt traps will be undertaken by the Contractor prior to the commencement of construction. • Air would be used as the flushing medium of the drilling equipment to avoid the groundwater being affected by the flushing medium. In addition, permanent casing may be provided to the drillhole of soil nail within the permeable colluvium layer as instructed by the Engineer to minimize the impact to the groundwater table situated at the permeable 				<p>Site Drainage</p> <p>TM standard under the WPCO</p>

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		<p>soil stratum.</p> <ul style="list-style-type: none"> An outlet pipe extending above the slope surface would be installed to facilitate collection of discharge of air, water and grout from the drillhole inserted with soil nail during grouting. All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. Exposed slope/soil surface should be covered by tarpaulin as soon as possible to reduce the potential of soil erosion. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94. Open stockpiles of construction materials or construction wastes on-site of more than 50m³ should be covered with tarpaulin or similar fabric during rainstorms. 				

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Waste Management						
8.19, 8.20		<p>Good site practice</p> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site. Training of site personnel in proper waste management and chemical waste handling procedures. Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. <p>Waste Reduction</p> <ul style="list-style-type: none"> Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. Encourage collection of aluminium cans, PET bottles and 	Contractor	Works Area	Construction Phase	

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		<p>paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force.</p> <ul style="list-style-type: none"> Any unused chemicals or those with remaining functional capacity shall be recycled. Proper storage and site practices to minimize the potential for damage or contamination of construction materials. Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste. 				
Ecological Impact						
3.110		The location of the soil nail installation should be carefully selected and adjusted on-site to avoid/minimize the damage of root system to the existing plants on slope surface. No tree felling is required.	Contractor	Works Area	Construction Phase	
3.111		Fences should be erected and installed along the boundary of the proposed works area before the commencement of works in order to minimize the disturbance to the natural woodland and shrubland habitats by preventing tipping, vehicle movements and encroachment of personnel onto the adjacent areas.	Contractor	Works Area	Construction Phase	
3.112		Specific mitigation measures for the two plant species of	Project	Works Area	Construction	

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		<p>conservation interest</p> <ul style="list-style-type: none"> A detailed vegetation survey of the affected species of conservation interest should be conducted by a suitably qualified botanist/ecologist with over 7 years relevant experience to identify the affected individuals of the floral species of conservation concern, including but not limited to Small Persimmon, Common Tutcheria, Bird-nest Fern and Chinese Pholidota. These species should be labeled on site prior to the commencement of works for better protection. 	Proponent		Phase	
3.113 & 3.114		To minimize the indirect impacts to the nearby stream course and drainage culvert. Site runoff control measures mentioned in Section of Construction Water Quality Impact should be implemented. There should be no site runoff and discharge to the nearby stream course and drainage culvert.	Contractor	Works Area	Construction Phase	
3.115		<p>Noise mitigation measures:</p> <ul style="list-style-type: none"> Mitigation measures listed in the section Construction Noise Impact should be implemented. Noise generating construction works should be implemented at daytime only. 	Contractor	Works Area	Construction Phase	

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		<ul style="list-style-type: none"> Measures such as noise barriers should be used to minimize disturbance to the bat roost identified close to the western side of the works area. 				
3.116		To minimize the construction dust impact to the vegetation within and in vicinity of the proposed works area, the mitigation measures listed in the section Construction Air Quality Impact should be implemented.	Contractor	Works Area	Construction Phase	
3.117		<p>Good site practice:</p> <ul style="list-style-type: none"> Placement of equipment in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural woodland habitat. Construction activities would be restricted to the proposed works area that would be clearly demarcated. The proposed works area would be reinstated immediately after completion of the works. Open burning on proposed works sites is illegal, and will be strictly enforced. Waste skips would be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site. 	Contractor	Works Area	Construction Phase	

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		<ul style="list-style-type: none"> Any soil contamination with fuel leaked from construction plants should be removed off-site. Disturbance to existing vegetation should be minimized wherever possible. In particular, adequate protection should be provided for mature trees located within or adjacent to the proposed works area. 				
3.118		<p>Compensatory planting due to the loss of trees and vegetations:</p> <ul style="list-style-type: none"> Planting of suitable shrubs/herbs, including the Small Persimmon, should be provided within the project area to compensate for the understorey vegetation of the woodland habitats affected by the landslide preventive works. Chinese Fan-palm (<i>Livistona chinensis</i>) should be planted near the existing bat roost in the project area to provide suitable habitat for the Short-nosed Fruit Bat after completion of landslide preventive works. 	Contractor	Works Area	Construction Phase	
3.121		<p>Monitoring programme:</p> <ul style="list-style-type: none"> For the plant individuals of conservation interest identified within the proposed works area, a specific monitoring programme of the plant individuals of conservation interest identified within the proposed works area during the detailed 	Contractor	Works Area	Construction Phase	

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		<p>vegetation survey should be carried out by a suitably qualified local ecologist(s) with over 7 years relevant ecological experience.</p> <ul style="list-style-type: none"> Regular monitoring of the trees, shrubs and herbs should be conducted to check on the health and condition of the plants. Monitoring should be conducted twice a month covering the whole construction period. 				
Landscape and visual Impact						
Table 4.5		<p>Due consideration on existing surrounding vegetation during construction:</p> <ul style="list-style-type: none"> Designate 'no-intrusion zones' Dust and erosion control for exposed soil All retained trees should be record photographically at the commencement of Contract, and carefully protected during the construction period. Allowance for adjustment of soil nails on site for the avoidance of tree trunks and tree roots <p>Appearance and view consideration:</p>	Contractor	Works Area	Construction Phase	EIAO-TM

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		<ul style="list-style-type: none"> Temporary hoarding barriers shall be sensitively designed, subtle, camouflaged and more 'permeable' so that they fit into the existing country park character Careful selection of security floodlights to avoid light pollution 				
Table 4.6		<ul style="list-style-type: none"> Existing topsoil shall be re-used where possible for new planting areas within the project 12 month establishment period for the soft landscape works shall be allowed in the main contract. All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works shall be reinstated to former conditions. Woodland mix is proposed to screen sensitive views, to match surrounding vegetation, and to provide greenery to the surrounding area. 	Contractor	Works Area	Operation Phase	EIAO-TM