


MTR Corporation Limited

TUEN MUN SOUTH EXTENSION

(No. EP-615/2022)

## Monthly Ardeid Monitoring Plan




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MTR Corporation Limited

Consultancy Agreement No. C1502  
(Variation Order No. C1502/009)**Environmental Monitoring and Audit  
(EM&A) for Tuen Mun South Extension****Monthly Ardeid Monitoring Plan**

October 2023

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Version: 3 Date: 11 October 2023

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## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 The Tuen Mun South Extension (TME) (hereinafter referred to as “the Project”) is one of the seven recommended railway schemes in the Railway Development Strategy 2014 (“RDS-2014”). The Project will extend the Tuen Ma Line (TML), from Tuen Mun (TUM) Station southwards by about 2.4 km, terminating at a new station near Tuen Mun Ferry Pier (i.e. Tuen Mun South (TMS) Station) with an intermediate station at Tuen Mun Area 16 (i.e. A16 Station).
- 1.1.2 An Environmental Impact Assessment (EIA) study for the Project was conducted in accordance with EIA Study Brief No. ESB-332/2020. The EIA Report and Environmental Monitoring and Audit (EM&A) Manual (Register No.: AEIAR-236/2022) were approved under the Environmental Impact Assessment Ordinance (EIAO), with an Environmental Permit (EP) granted on 18 August 2022 (EP No: EP-615/2022).
- 1.1.3 The Project extends southward from the existing overrun at TUM Station, and its viaduct structure will be located adjacent to an ardeids night roost in Tuen Mun Park (hereafter referred to as “TMP Night Roost”). This TMP Night Roost comprises a group of mature trees (Big-leaved Fig (*Ficus virens*) and Chinese Banyan (*Ficus microcarpa*), which supports night roosting ardeids, including Little Egret (*Egretta garzetta*), Great Egret (*Ardea alba*), and Chinese Pond Heron (*Ardeola bacchus*). According to the ecological surveys conducted in 2021 during the EIA study, the abundance of night roosting ardeids at this TMP Night Roost ranged from 39 individuals in wet season to 300 individuals in dry season. The construction of the viaduct structure may result in potential disturbance and indirect impact on the night roosting ardeids.
- 1.1.4 Mitigation measures include a buffer zone of 100 m from the TMP night roost, where the working hours of construction activities were recommended in the approved EIA Report to minimise the potential disturbance to TMP Night Roost during the construction stage. Monthly ardeid monitoring was therefore proposed under the approved EIA Report, when construction activities are present within the 100 m buffer zone, to monitor the potential impact on the TMP night roost, and evaluate effectiveness of the proposed mitigation measures during construction, which include avoiding direct impact to the TMP Night Roost (e.g. careful planning of pruning works), and minimising indirect disturbances that could displace or discourage the use of the night roost. Monthly ardeid monitoring was also proposed for the first six months during operation, or until the end of first dry season, whichever is later.
- 1.1.5 The construction works of the Project are tentatively scheduled to commence in Q4 2023. Pursuant to Conditions 2.18 of EP-615/2022, a Monthly Ardeid Monitoring Plan (MAMP) shall be prepared by qualified ecologist(s) appointed under Condition 2.5 of EP-615/2022 and shall be submitted to the Director of Environmental Protection for approval no later than two months before commencement of construction works of the Project. The MAMP shall provide the details including but not limited to the monitoring programme, methodology and location of the monthly ardeid monitoring survey, also include an implementation schedule in table form to clearly list out the mitigation measures to be implemented, and the implementation party, location, timing, and environmental performance required for implementation of the mitigation measures.

### 1.2 Purpose of this Monthly Ardeid Monitoring Plan (MAMP)

- 1.2.1 This Monthly Ardeid Monitoring Plan (MAMP) presents the programme, methodology and location of the monthly ardeid monitoring, as well as an implementation schedule table including mitigation measures to be implemented, implementation party, location, timing, environmental performance required for implementation of the mitigation measures.

**2 MONTHLY ARDEID MONITORING**

**2.1 Monitoring Methodology**

- 2.1.1 In accordance with the Pre-construction Ardeid Survey Plan (PASP) approved under EP Condition 2.16 of EP-615/2022, pre-construction ardeid surveys (PAS) should be undertaken to confirm the location of TMP Night Roost and identify new/alternative locations of ardeid night roosts (if any) prior to the construction of the Project. The confirmed location and condition of the TMP Night Roost will be presented in the Pre-construction Ardeid Survey Report (PASR).
- 2.1.2 During the construction phase, monthly ardeid monitoring will be conducted in areas within the 100 m Buffer Zone of the TMP Night Roost, based on the confirmed location and condition of the TMP Night Roost recorded from the PAS. Direct observation (with the aid of binoculars) of the night roosting ardeids will be made from the proposed vantage points (VR1 at Tuen Mun Park and VR2 at Tin Hau Bridge) or alternative vantage points where possible (e.g. rooftop of Tuen Mun station), and other vantage points if new/alternative locations of ardeid night roost are identified. The location of the TMP Night Roost, 100 m Buffer Zone and proposed vantage points are shown in **Figure C1502/C/TME/ACM/M63/001**.
- 2.1.3 Ardeid species, abundance, flight lines, locations, the tree condition and species used by night roosting ardeids will be recorded as close to the night roost(s) as possible. Observation of the flight lines (including flight direction, flight height, and returning time of the pre-roosting and roosting ardeids) will be undertaken at the proposed vantage points. Record will also be taken in case of any changes in site condition /disturbance (including both construction and non-construction related activities) observed at the monitoring locations during each monitoring visit.
- 2.1.4 The monthly ardeid monitoring will start from approximately an hour before sunset and last until nightfall, which will be the peak period of ardeid activities at the night roost and pre-roost sites. The exact sunset time of the survey will be made reference to the Hong Kong Observatory.
- 2.1.5 In the event that night-time construction works would be conducted within 100 m of the TMP Night Roost, weekly monitoring of the night roost would be conducted during the period of night-time works. The methodology of the weekly monitoring should follow that of the monthly monitoring (**Sections 2.1.2 – 2.1.4** refer).

**2.2 Monitoring Programme**

- 2.2.1 The ardeid monitoring will be conducted when construction activities are present within the 100 m buffer zone, and also during the first six months of the operation phase or until the end of first dry season, whichever is later (**Table 2.1** refers). According to the tentative schedule of project implementation, the ardeid monitoring should be conducted when the construction activities are being conducted within the 100 m buffer zone, and from the commencement of operation tentative in 2030, subject to the location of construction works during the construction phase, and the commencement date of TME operation.

**Table 2.1 Tentative Timeline for Ardeid Monitoring**

Project Phasing	Tentative Period <sup>1</sup>	Period of Monitoring <sup>1</sup>	Frequency of Monitoring
Construction Phase	Q4 2023 – 2030	Q4 2023 –2030	<ul style="list-style-type: none"> <li>• Monthly (when construction activities are present within 100 m Buffer Zone)</li> <li>• Weekly (when night-time construction activities are present within 100 m Buffer Zone)</li> </ul>
Operation Phase	2030 onward	2030 for the first 6 months of operation or till the end of the first dry season	<ul style="list-style-type: none"> <li>• Monthly</li> </ul>

Note: <sup>1</sup> Subject to change based on the latest project timeline

### 2.3 Baseline Conditions of the TMP Night Roost

2.3.1 During the ardeid night roost survey conducted in between January 2021 to June 2021 for the TME EIA Study, the abundance of night-roost ardeids recorded at the TMP Night Roost comprises Little Egret, Great Egret and Chinese Pond Heron, with the majority of them being Little Egret (MTRCL, 2022) (**Table 2.2** refers). A peak count of 300 ardeids individuals were recorded in January 2021 and lowest abundance of 39 ardeids individuals were recorded in May 2021 during the night roost survey.

**Table 2.2 Number and Species of Ardeids Recorded in the TMP Night Roost in 2021**

Ardeid Species	Jan 2021	Feb 2021	March 2021	Apr 2021	May 2021	Jun 2021
Little Egret	254	105	122	56	31	38
Great Egret	37	41	17	18	7	8
Chinese Pond Heron	9	3	7	2	1	2
<b>Total</b>	<b>300</b>	<b>149</b>	<b>146</b>	<b>76</b>	<b>39</b>	<b>48</b>

2.3.2 The PAS will be conducted in August 2023 according to the agreed PASP, and the results from the PAS will be presented in the Pre-construction Ardeid Survey Report (PASR). Survey findings from both TME EIA Study (MTRCL, 2022) and the PAS will be presented in the monthly EM&A Report as the baseline condition for monthly ardeid monitoring.

## 3 REPORTING AND FOLLOW-UP ACTIONS

3.1.1 According to the approved EM&A Manual, monthly EM&A reports should be submitted during the construction phase of the Project.

3.1.2 During the construction phase, where monthly ardeid monitoring was required (i.e. when construction activities are present within 100 m Buffer Zone), findings from the ardeid monitoring should be presented in the monthly EM&A report. The presented findings should include locations, tree condition and species used at the TMP night roost, recorded ardeid species and their abundance, and flight lines, which will be evaluated with reference to the baseline survey results from the approved EIA Report and the PASR. Evaluation of the monitoring findings will determine the effectiveness of the proposed mitigation measures on the TMP Night Roosts. Where significant decline in the no. of night-roosting ardeids occurred continuously, the cause of the decline should be identified and, if necessary, the existing implementation of mitigation measures should be reviewed carefully and additional mitigation measures should be suggested, where necessary. Where weekly ardeid monitoring was required, the monitoring results will be also presented in the monthly EM&A report.

3.1.3 During the operation phase, monthly ardeid monitoring will be conducted for the first 6 months of operation or till the end of the first dry season, and the findings from the monthly ardeid monitoring should be presented separately as an Ardeid Monitoring Report.

3.1.4 The evaluation of the implemented mitigation measures will be made reference to the implementation schedule (**Appendix A** refers), which presents details of the proposed mitigation measures, including the implementation party, location, and timing of the measures.

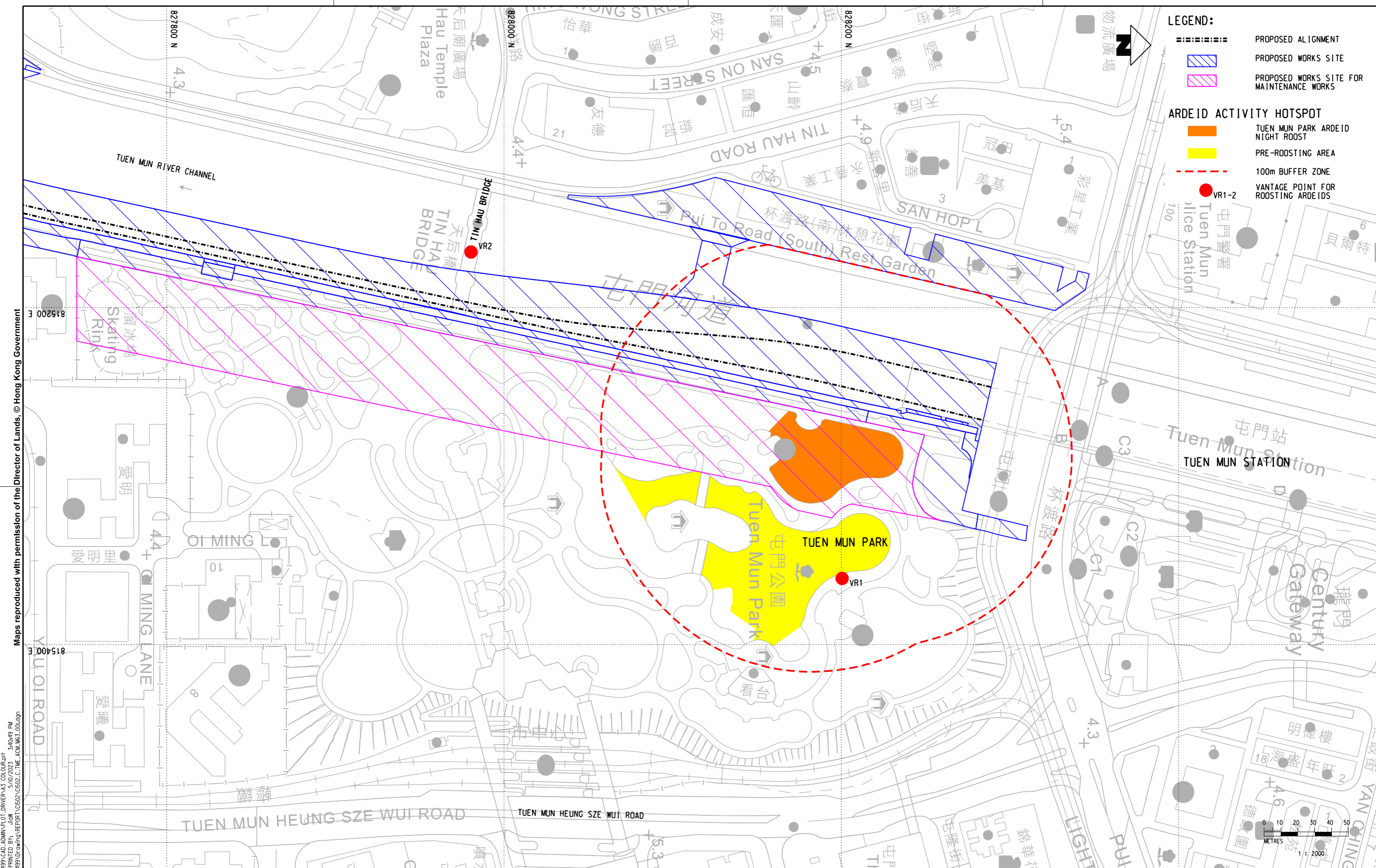
3.1.5 Subject to the findings of the monthly ardeid monitoring, in the event that the TMP Night Roost is relocated to 100 m away from the Project boundary naturally, restriction on working hours would be ceased, subject to further consultation and agreement with AFCD/EPD. However, if the TMP Night Roost is relocated to a location within 100 m from the works site, or a new night roost is found within 100 m from the works site, the buffer zone should be adjusted or new buffer zone should be included accordingly.

**4 REFERENCE**

MTR Corporation Limited (MTRCL) (2022). Environmental Impact Assessment Study for Tuen Mun South Extension – Environmental Impact Assessment (EIA) Report and Environmental Monitoring and Audit (EM&A) Manual. Register No.: AEIAR-236/2022.

**Figure**

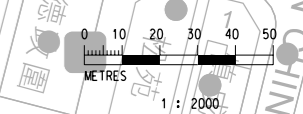




- LEGEND:**
- PROPOSED ALIGNMENT
  - PROPOSED WORKS SITE
  - PROPOSED WORKS SITE FOR MAINTENANCE WORKS
- ARDEID ACTIVITY HOTSPOT**
- TUEN MUN PARK ARDEID NIGHT ROOST
  - PRE-ROOSTING AREA
  - 100m BUFFER ZONE
  - VANTAGE POINT FOR ROOSTING ARDEIDS

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ORIGINATOR

**AECOM**

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TITLE

**C1502**  
**TUEN MUN SOUTH EXTENSION**  
**LOCATION OF TUEN MUN PARK ARDEID NIGHT ROOST**

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FIGURE NO. C1502/C/TME/ACM/M63/001

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## Appendix

**Appendix A Proposed Mitigation Measures related to TMP Night Roost**

EP Condition / EIA Ref.	Recommended Mitigation Measures	Objective of the Measures	Implementation & Maintenance Party	Implementation Location	Implementation Time	Environmental Performance required for Implementation of the Measures
EIA S8.9.3, EIA Table 8.17	<p><b><i>Maintenance Works at Tuen Mun Park (TMP)</i></b></p> <ul style="list-style-type: none"> <li>• Tree felling at the Tuen Mun Park should be avoided.</li> <li>• Maintenance works should only be limited to necessary pruning works, at overgrown tree branches that may pose safety issue to the public, or obstruction of construction within the works site and subsequent of railway operation.</li> <li>• Pruning of trees of the ardeids night roost should only be conducted when no ardeids are perching on the trees.</li> </ul>	To avoid direct impact on the TMP night roost	Contractor	Works sites adjoining to and within Tuen Mun Park	Construction Phase	No direct loss of the roosting substratum at TMP
EP Condition 2.22, EIA S8.9.4 to S 8.9.5, EIA Table 8.17	<p><b><i>TUM Overrun Modification Works</i></b></p> <ul style="list-style-type: none"> <li>• Careful arrangement of work programme should be adopted as far as practicable to avoid disturbances from construction activities near the night-roost (such as noise, light and other human disturbance), especially during dry season (when ardeids are at relatively higher abundance).</li> <li>• Mitigation measures such as movable noise enclosures and movable barriers should be adopted to mitigate the noise and light from the night-time construction activities and to minimise disturbance to the night roosting ardeids, where necessary.</li> <li>• Proper construction planning would also be implemented to arrange night-time activities in wet season as far as practicable. Where possible, these activities will also be scheduled on non-consecutive days to avoid continuous disturbance on the night roost.</li> </ul> <p><b><u>Modification works that does not require the use of Powered Mechanical Equipment (PME):</u></b></p> <ul style="list-style-type: none"> <li>• Night-time activities should be avoided as far as practicable.</li> <li>• No construction activities with the use of PME within buffer zone should follow control of working hours (Table A1 refers).</li> </ul> <p><b>Table A1 Proposed Time for the Control of Noisy Construction Activities</b></p>	To avoid/minimise disturbance to the night roost through control of construction works / activities within 100m from Ardeid Night Roost	Contractor	Works sites within 100m from the Ardeid Night Roost as shown in <b>Figure No. C1502/C/TME/A CM/M63/001</b>	Construction Phase	Monthly ardeid monitoring findings within the range of survey findings taken in the EIA stage

EP Condition / EIA Ref.	Recommended Mitigation Measures			Objective of the Measures	Implementation & Maintenance Party	Implementation Location	Implementation Time	Environmental Performance required for Implementation of the Measures												
	<table border="1" data-bbox="353 338 1061 580"> <thead> <tr> <th data-bbox="353 338 510 395">Months</th> <th data-bbox="510 338 752 395">Reference Time of Sunset <sup>(1)</sup></th> <th data-bbox="752 338 1061 395">Control of Noisy Construction Activities <sup>(2)</sup></th> </tr> </thead> <tbody> <tr> <td data-bbox="353 395 510 453">Sep – Feb</td> <td data-bbox="510 395 752 453">17:38 – 18:27</td> <td data-bbox="752 395 1061 453">17:08 – 07:30 (on the following day)</td> </tr> <tr> <td data-bbox="353 453 510 510">Mar – May</td> <td data-bbox="510 453 752 510">18:27 – 19:03</td> <td data-bbox="752 453 1061 510">17:57 – 07:30 (on the following day)</td> </tr> <tr> <td data-bbox="353 510 510 580">Jun – Aug</td> <td data-bbox="510 510 752 580">18:41 – 19:11</td> <td data-bbox="752 510 1061 580">18:11 – 07:30 (on the following day)</td> </tr> </tbody> </table> <p data-bbox="353 580 412 600">Notes:</p> <p data-bbox="353 600 1061 644">(1) Reference was made to the sunset time in year 2021 under the approved EIA Report.</p> <p data-bbox="353 644 1061 753">(2) Noisy construction activities should be ceased before the proposed time, except for contingent arrangement of concreting works due to uncontrollable issues. Such occurrence should be notified by the Contractor to Engineer/Engineer's Representative, Environmental Team Leader and Independent Environmental Checker on the same day of the occurrence.</p> <ul data-bbox="353 778 1061 887" style="list-style-type: none"> <li>• Should night-time works be unavoidable, the following measures should be adopted: movable barrier; light control; and proper construction planning to arrange works in wet season as far as practicable.</li> </ul> <p data-bbox="353 906 949 932"><b>Noisy modification works that require the use of PME:</b></p> <ul data-bbox="353 932 1061 1185" style="list-style-type: none"> <li>• Night-time activities should be avoided.</li> <li>• Daytime construction activities within buffer zone should follow control of working hours (Table A1 above).</li> <li>• Where use of PME is unavoidable during the specified control time (as presented in Table A1), such as after evening or during night-time, a separate detailed proposal shall be prepared and agreed with relevant authorities prior to the commencement of such works to present the details (e.g. duration and frequency) and the corresponding measures.</li> </ul>			Months	Reference Time of Sunset <sup>(1)</sup>	Control of Noisy Construction Activities <sup>(2)</sup>	Sep – Feb	17:38 – 18:27	17:08 – 07:30 (on the following day)	Mar – May	18:27 – 19:03	17:57 – 07:30 (on the following day)	Jun – Aug	18:41 – 19:11	18:11 – 07:30 (on the following day)					
Months	Reference Time of Sunset <sup>(1)</sup>	Control of Noisy Construction Activities <sup>(2)</sup>																		
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EP 2.22, EIA S8.9.4 to S 8.9.5, EIA Table 8.17	<p data-bbox="353 1185 770 1214"><b>Provision of Temporary Steel Platform</b></p> <ul data-bbox="353 1214 1061 1323" style="list-style-type: none"> <li>• Construction activities should be conducted during daytime.</li> <li>• Any activities with the use of PME within buffer zone should follow control of working hours (Table A1 above refers).</li> </ul>			To avoid/minimise disturbance to the night roost through control of construction works / activities within	Contractor	Works sites within 100m from the Ardeid Night Roost as shown in <b>Figure No. C1502/C/TME/A CM/M63/001</b>	Construction Phase	Monthly ardeid monitoring findings within the range of survey findings taken in the EIA stage												

EP Condition / EIA Ref.	Recommended Mitigation Measures	Objective of the Measures	Implementation & Maintenance Party	Implementation Location	Implementation Time	Environmental Performance required for Implementation of the Measures
		100m from Ardeid Night Roost				
EP 2.22, EIA S8.9.4 to S 8.9.5, EIA Table 8.17	<p><b>Construction of Viaduct and Concreting works</b></p> <ul style="list-style-type: none"> <li>• Timing of the noisy construction activities should be arranged to avoid impact on the night roosting ardeids as far as possible.</li> <li>• Any activities with the use of PME within buffer zone should follow control of working hours (Table A1 above refers).</li> <li>• Concreting works should be limited to daytime under normal circumstances.</li> <li>• Construction works should be properly planned for completion of the daily noisy construction works within the buffer zone 30 minutes before sunset, especially for concreting works of bored piles which should be carried out continuously to avoid the cold joint.</li> <li>• The concreting works beyond the sunset time should be considered as contingency arrangement due to the uncontrollable issues (i.e. traffic jam, delay of concrete supply, breakdown of plant / equipment, etc). In the event of a contingency event, a notice with justification and arrangement details should be prepared and recorded in the EM&amp;A reports. This notice should also record any change in the ardeid night roost (e.g. displacement or abandonment) observed during contingency arrangement and any mitigation measures implemented and/or to be implemented. A reporting mechanism should be developed with details stated in Environmental Monitoring and Audit (EM&amp;A) Manual. A monthly monitoring and observation on condition of night roost should be carried out during the construction phase to monitor the impact on the night roost.</li> </ul>	To avoid/minimise disturbance to the night roost through control of construction works / activities within 100m from Ardeid Night Roost	Contractor	Works sites within 100m from the Ardeid Night Roost as shown in <b>Figure No. C1502/C/TME/ACM/M63/001</b>	Construction Phase	Monthly ardeid monitoring findings within the range of survey findings taken in the EIA stage
EIA S8.9.11	<p><b>Control Glare / Lighting</b></p> <p>The overall reduction of glare during both construction and operational phases should also be considered. A balance between lighting for safety, and avoiding excessive lighting can be achieved through the use of directional lighting to avoid light spill into sensitive</p>	To minimise the disturbance impacts to the surrounding habitats and their associated wildlife arising from the	MTRCL, Contractor	All works sites/areas, stations, viaduct	Construction and Operation phases	Monthly ardeid monitoring findings within the range of survey findings

EP Condition / EIA Ref.	Recommended Mitigation Measures	Objective of the Measures	Implementation & Maintenance Party	Implementation Location	Implementation Time	Environmental Performance required for Implementation of the Measures
	areas (e.g. the ardeid night roost), and control timing of lighting periods, particularly for the works site(s) located in proximity to the ardeid night roost in Tuen Mun Park, and during peak roosting season of ardeid (e.g. dry season), hence minimising the potential indirect impact on the community of the night-roosting ardeids.	construction activities and railway operation				taken in the EIA stage
EIA S8.9.12	<p><b>Use of Non-Transparent Panels</b></p> <p>Subject to the detailed design, an extent of about 85m long (starting from the southern end of existing overrun structure) and 1m high vertical non-transparent panels on top of parapet of viaduct would be established along the eastern side of the viaduct which is adjacent to the ardeid night roost. The provision of this vertical panel on top of the parapet would be able to reach the height of the operating railway train windows, thus providing a shielding effect.</p>	To minimize the potential disturbance from railway operation during night-time period	MTRCL, Contractor	Along the eastern side of the about 85m long viaduct (starting from the southern end of existing overrun structure) adjacent to the ardeid night roost	Operation phase	Monthly ardeid monitoring findings within the range of survey findings taken in the EIA stage