#### Contract HY/2011/09

# Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Landscape Monitoring Report (Long Term Management)

(23 May 2022 – 22 May 2023)

Certified By

Dr. Priscilla Choy Environmental Team Leader

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

WELLAB accepts no responsibility for changes made to this report by third parties

Counter-signed by

Name: William Wong

Post: SE1/HKLR, Highways Department

Date: 20 July 2023

#### WELLAB LIMITED

Room 1714, Technology Park, 18 On Lai Street, Shatin, NT, Hong Kong Tel: (852) 2898 7388 Fax: (852) 2898 7076 Website: www.wellab.com.hk

### **TABLE OF CONTENTS**

		Pa	age
1	INTRO	ODUCTION	1 -
Bac	kground	ıd	- 1 -
Pur	pose of	the Report	1 -
2	METH	HODOLOGY	- 2 -
3	ANNU	JAL MONITORING FOR PLANTING WORKS	3 -
Site	Descrip	ptionn on Planting Works and Maintenance Operations	3 -
4	CONC	CLUSIONS	9 -
5	RECO	DMMENDATIONS	9 -
LIS	ST OF T	TABLES	
Tab	le 3.1	Summary of Plant Species	
Tab	le 3.2	Appearance of <i>Plumeria rubra</i> under the Bridge Deck and at the exposure to Sunlight	Area
Tab	le 3.3	Major Health Defects observed on Trees	
Tab	le 5.1	Summary of Recommendations for the Identified problems	

# LIST OF APPENDICES

Appendix A Soft Landscape Layout Plan

#### 1 INTRODUCTION

#### **Background**

- 1.1 The Hong Kong Zhuhai Macao Bridge Hong Kong Link Road (HKLR) comprises a 9.4km long viaduct section from the HKSAR boundary to Scenic Hill on the Airport Island; a 1km tunnel section to the reclamation formed along the east coast of the Airport Island and a 1.6km long at-grade road section on the reclamation connecting to the HKBCF. The tunnel section of HKLR will pass under Scenic Hill, Airport Road and Airport Railway to minimize the environmental and visual impacts to Tung Chung residents.
- 1.2 An Environmental Impact Assessment (EIA) Study (Reg. No. AEIAR-144/2009) has been undertaken to provide information on nature and extent of environmental impacts arising from the construction and operation of HKLR. Pursuant to Section 13 of the EIAO, the Director of Environmental Protection has issued Further Environmental Permit (No. FEP-01/352/2009/D) based on the Application No. FEP-186/2018 for HKLR to the Airport Authority as the Permit Holder on 29 March 2018.
- 1.3 The Hong Kong Link Road project has been separated into two contracts. They are Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between Scenic Hill and Hong Kong Boundary Crossing Facilities and Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill (hereafter referred to as the Contract).
- 1.4 Dragages -China Harbour-VSL JV (hereinafter called "the Contractor") was the main contractor of the Contract. All construction activities undertaken by Contract No. HY/2011/09 for construction of a dual 3-lane carriageway in the form of viaduct from the HKSAR boundary to Scenic Hill of approximately 9.4km in length under the Environmental Permit (EP-352/2009/D) have been completed in August 2018. In addition, HKLR has been commissioned on 24 October 2018.
- 1.5 According to Environmental Monitoring and Audit Manual for Hong Kong Link Road (EM&A Manual), monitoring of the long-term management of the planting works in the period up to 10 years after completion of the construction works are required. All landscape works were completed on 22<sup>nd</sup> May 2019. Wellab Limited (Wellab) was appointed to undertake this Annual Monitoring of Long Term Management of Planting Works.

#### **Purpose of the Report**

1.6 This Annual Monitoring Report for Long Term Management of Planting Works under the Contract which present the monitoring methodology of the long-term management of the planting work and report any areas of vegetation (i.e. newly planted trees) which is failed to establish.

#### 2 METHODOLOGY

- 2.1 In accordance with Section 14.2.10 of the EM&A Manual, the planting works shall be monitored during the first 10 years of the operation phase of the project. Any areas of vegetation which is failed to establish, should be corrected by the relevant maintenance parties at the earliest opportunity. The maintenance requirement of the planting works stated under the 10-Year Management Programme is included in the monitoring requirement.
- 2.2 According to Environment, Transport and Works Bureau Technical Circular (Works) No. 2/2004, maintenance operations for vegetation on landscape areas are required to ensure the healthy establishment and growth of plants, which in general include watering, fertilizing, weeding, pruning, mulching, pest control, replacement etc. as appropriate.
- 2.3 This annual monitoring is to check the location and plant species which have been planted according to the approved Soft Landscape Layout Plan and ensure the planting maintenance operations are properly carried out during the operation phase of the Contract, including:
  - Inspection for fungal / viral attacks and pest infestation;
  - Litter collection;
  - Watering;
  - Weeding removal;
  - Replacement of defective planting material;
  - Grass cutting / groundcover trimming and removal of arisings;
  - Fertilizing application as required in specification; and
  - Aeration / mulching application.

#### **Location of Planting Area**

2.4 The soft landscape layout plan provides updated information of details such as locations of planting works and species, and these were agreed by the Airport Authority Hong Kong is shown in **Appendix A**.

#### **Monitoring Frequency**

2.5 Monitoring of planting works shall be carried out annually for 10 years after completion of the landscape construction works on 22<sup>nd</sup> May 2019.

#### 3 ANNUAL MONITORING FOR PLANTING WORKS

#### Monitoring

3.1 This Annual Monitoring for Long Term Management of Planting Works under the Contract was conducted on 6<sup>th</sup> May 2023.

#### Site Description

3.2 There are 4 tree species planted at the designated planting zones at Hong Kong International Airport. The summary of these plant species is shown in **Table 3.1.** 

**Table 3.1 Summary of Plant Species** 

1. TREE SPECIES				
<b>Botanical Name</b>	Chinese Name	Quantity		
Bauhinia blakeana	洋紫荊	26		
Plumeria rubra	雞蛋花	184		
Phoenix roebelenii	日本葵	28		
Bauhinia variegate	宮粉羊蹄甲	18		

#### Observation on Planting Works and Maintenance Operations

3.3 The location and plant species have been checked during the inspection which are followed the approved Soft Landscape Layout Plan in **Appendix A**.

Growing of Plants in Planting Area

3.4 During the site inspection, planted trees were observed generally growing at the designated planting area. However, health defects were observed, and all these defects of some plants were mainly due to the site constraints and insufficient watering.

Health Defects

3.5 The surveyed trees appear in generally poor to very poor health. Major health defects, which are signs of tree declining or aging, were commonly observed on the surveyed trees. Health defects observed included vigorous growth of epicormics shoots, decay of bark tissue, bark cracking, dead branches, pest infestation, fungal growth, leaning, sparsely foliage, unbalanced crown, dieback twigs on tree crown and withered leaves.

Site Constraints

3.6 According to Clause 2.6(i) of Guidelines on Tree Transplanting (September 2014) that "The locations of the tree and/or the receptor site may pose constraints to the transplanting works. Locations like underneath a flyover or footbridge, adjacent to a slope, too close to a building/structure, vehicular and pedestrian flows may add considerable difficulties to the transplanting work."

3.7 In addition, most of the *Plumeria rubra* are dead or in very poor health condition due to too much shade and not enough sun under the bridge deck. The photographic records in **Table 3.2** showing the appearance of *Plumeria rubra* planted under the bridge deck and at the area exposure to sunlight.

Table 3.2 Appearance of Plumeria rubra under the Bridge Deck and at the Area exposure to Sunlight



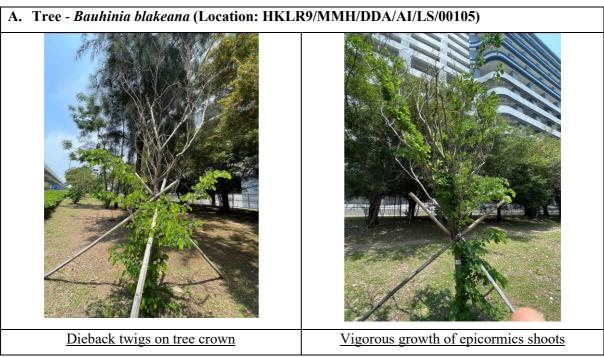
Very poor health condition of Plumeria rubra under Bridge Deck

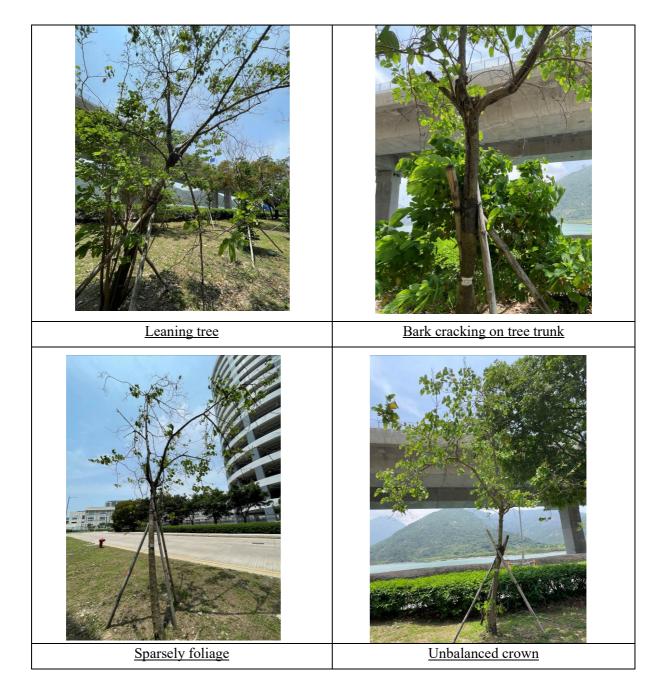


Fair health condition of Plumeria rubra at the area exposure to sunlight

3.8 The photographic records of the major health defects observed on trees are shown in **Table 3.3**.

Table 3.3 Major Health Defects observed on Trees











Serious pest infestation

Sparsely or no foliage







Decay of bark tissue

#### C. Tree - Phoenix roebelenii (Location: HKLR9/MMH/DDA/AI/LS/00109)





Withered leaves

# D. Tree - Bauhinia variegate (Location: HKLR9/MMH/DDA/AI/LS/00105) Dieback twigs on tree crown Vigorous growth of epicormics shoots Sparsely foliage and unbalanced crown Leaning tree

3.9 In addition, the soil surface at the planter under the bridge deck was very dry during site inspection. Withered grass ground cover and no sprinkler irrigation system was observed (Photo 1). Moreover, most of the plants were observed dead or going to die soon at the planting location (Photo 2).



Photo 1 – Dry soil surface and withered grass ground cover



Photo 2 – Most of the plants were dead and nearly dead due to lack of sunlight and water

#### 4 CONCLUSIONS

4.1 There are 4 tree species planted according to the approved soft landscape layout plan at the designated planting zones at Hong Kong International Airport under the Contract. All planted trees were observed generally growing at the designated planting area, but tree health conditions are observed declining.

#### 5 RECOMMENDATIONS

5.1 The summary of recommendations for Long Term Management of Planting Works are presented in **Table 5.1**.

Table 5.1 Summary of Recommendations for Long Term Management of Planting Works

No.	Description	Recommendations
1	Soil condition	For the soil at the planting zone under the bridge deck is very dry. Water must be added the area.
2	Dead plants and any other plants found to be in poor conditions	Replacing or remove all dead plants and any other plants found to be in poor conditions.
3	Vigorous growth of epicormics shoots	Properly pruning on epicormic shoots.
4	Dieback twigs on tree crown	Properly remove die back tree branches.
5	Unbalanced crown	Crown cleaning consists of selective removal of dead, dying, diseased and weak branches from a tree's crown.
6	Leaning tree	Providing stakes for leaning trees; re-staking all trees with broken/leaning tree stakes
7	Pest infestation	Implement pest control measures. Apply fungicides where appropriate. Liaise with a professional tree specialist to evaluate the extent of the damage to the tree and recommend a course of action.
8	Decay of bark tissue / dead branches	Use a sharp knife or wood chisel to give a clean cut to the wound area so the dead bark is not impeding the growth of the callous or "wound wood" that will grow to attempt to compartmentalize the decay of the wound. Remove the dead branches.
9	Withered leaves	Fertilizing, watering and mulching the plants regularly to replenish the soil with nutrients and microorganisms

No.	Description	Recommendations
10	Sparsely foliage	Apply sufficient water around planting location, use fertilizer, and properly pruning of branches and tips for promoting plant growth.

# APPENDIX A SOFT LANDSCAPE LAYOUT PLAN

