

PROVISIONAL LOCAL VESSELS ADVISORY COMMITTEE

Tung Chung Cable Car Project

Purpose

1. The purpose of this paper is to advise members of the alignment and profile of the cable car system at Tung Chung Bay. It also provides detailed information on the vertical clearance of the cableway to demonstrate the section above Tung Chung Bay will not compromise the safety of the marine operation.

Background

2. MTR Corporation's (MTRC) Tung Chung Cable Car Project is currently progressing to the installation stage for completion in early 2006. Upon completion of the construction, the cableway across the Tung Chung Bay will pose a permanent height restriction to the marine traffic. The alignment and profile of the cable car system is shown in Figure 1.

Rope Profile

3. The cable car system adopted for this Project, namely bi-cable system, includes a track rope and a haul rope for each direction of the cableway. As far as the marine operation is concerned, the level of the haul rope is more critical than the track rope because the haul rope is always lower than the track rope. The vertical profile of the haul rope is dependent on the state of the cable car operation – the rope will become slack and drop closer to the sea when the cable car system is not in operation.

4. In addition, the profile will also be affected by the dynamic effects, which include sudden braking action/reaction, wind impact, oscillation and safety factor etc.

Vertical Clearance

5. The vertical clearance is calculated from the lowest level of the cable car system minus the extreme sea level and the safety factor etc.

6. When the cable car system is in operation, its lowest level is referred to the soffit of the lowest cabin on the cableway. Whilst it is out of normal operation, its lowest level is the lowest point of the haul rope because there is no cabin on the line in this state.

7. The extreme sea level refers to the highest astronomical tide (HAT) at Tai O, which is 2.9mCD (Chart Datum). The Chart Datum is 0.15m below the Principal Datum (PD). The safety factor allowed is 1.0m.

8. There are four scenarios (See Figure 2), which would allow different vertical clearance at Tung Chung Bay. They are described below.

a. Normal Operation without Dynamic Effects

The cable car system is in operation without the influence of the dynamic effects. The level of the lowest cabin is +52.1mPD. Therefore the vertical clearance for this scenario is 48.35m (52.1-2.9-1.0+0.15).

b. Normal Operation with Dynamic Effects

The cable car system is in operation under the influence of the dynamic factors. The level of the lowest cabin is +45.3mPD. Therefore the vertical clearance achieved is 41.55m (45.3-2.9-1.0+0.15).

c. Out of Normal Operation (no cabins on line) without Dynamic Effects

The cable car system is out of normal operation without the influence of the dynamic effects. The lowest level of the haul rope is +34.7mPD. The vertical clearance is thus 30.95m (34.7-2.9-1.0+0.15).

- d. Out of Normal Operation (no cabins on line) with Dynamic Effects
The cable car system is out of normal operation under the influence of the dynamic factors. The lowest level of the haul rope is +16.5mPD. The vertical clearance is therefore 12.75m (16.5-2.9-1.0+0.15).

Air Draft Restriction

9. According to the above, the minimum vertical clearance of 12.75m in scenario (d) is used to determine the air draft restriction. Since height restriction is usually expressed in whole number, the maximum air draft for vessels to pass safely underneath the cable car system is proposed at **12.0m**. The proposed air draft restriction will not pose any significant impact to the existing marine traffic transiting Tung Chung Bay, which are ferries and launches with air draft of less than 8m.

Control Measures

10. The cableway across the Tung Chung Bay is located between the Tung Chung Bridges Area in the east and the Airport Approach Restricted Area No.1 in the west. (See Figure 3)

11. The Tung Chung Bridges Area in the east imposes a height restriction of 8.0m. The bridges are deemed physical barriers that prohibit any overheight marine vessels entering the Tung Chung Bay from the east.

12. Vessels with air draft exceeding 8.0m will have to enter the Tung Chung Bay from the west via the Airport Approach Restricted Area No. 1. However, this restricted area prohibits all marine traffic and it is controlled by a permit system operated by the Marine Department. When a vessel applies to enter the Airport Approach Restricted Area No.1, the Marine Department will seek advice from the Civil Aviation Department and depending on its height, stipulates the conditions and the time at which the vessel can enter the Tung Chung Bay and pass underneath the cable car system.

13. Since the vertical clearance of the cable car system in normal operation hours (tentatively from 1000 hours to 2000 hours daily) will be maintained at 41.55m, vessels exceeding the 12.0m air draft restriction may be permitted to pass under the cableway during the hours when the cable car is in operation, subject to obtaining the necessary permit referred to in paragraph 12 above.

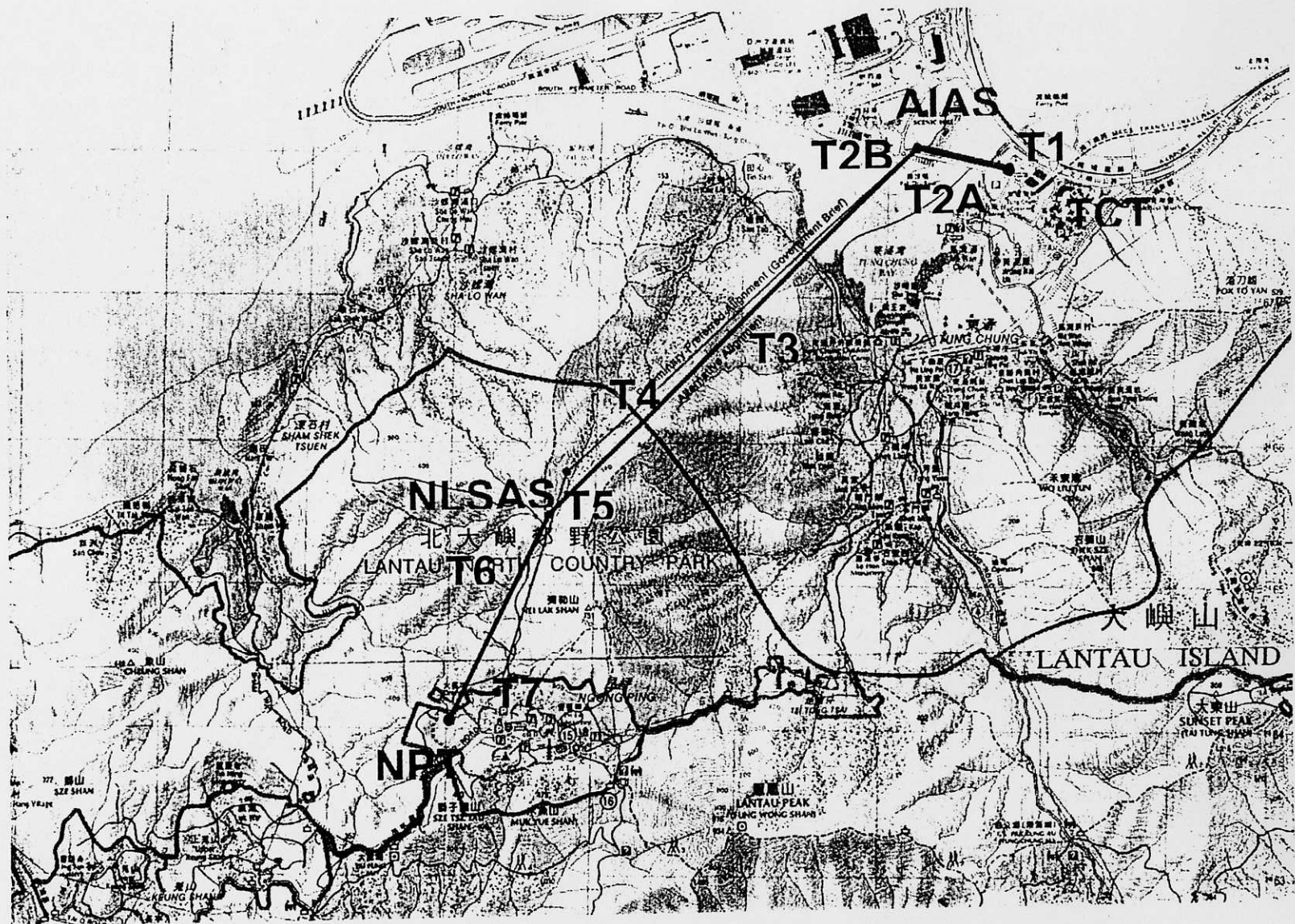
Recommendation

14. Members are recommended to take note of the air draft restriction of the cableway. Upon the completion of the cable car system at Tung Chung Bay in early 2006, the vertical clearance of the cableway at 12.0m will be promulgated by a Marine Department Notice and relevant navigation charts will be updated accordingly.

Presentation

15. Representatives from the MTRC accompanied by T.F. LI of Marine Department will present the paper.

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Alignment of Tung Chung Cable Car

Figure 2

