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**(ACE Paper 60/96)**  
**for information**

**INFORMATION PAPER FOR THE ADVISORY COUNCIL ON THE  
ENVIRONMENT**  
**New Airport at Chek Lap Kok**  
**Proposed Options for Permanent Aviation Fuel Receiving Facility and**  
**Pipeline Routes**

**Purpose**

1. The purpose of this paper is to brief Members on the progress to date of studies aimed at identification of suitable locations for the permanent aviation fuel receiving facility (AFRF) to supply fuel, via a pipeline, to the new airport at Chek Lap Kok.

**Background**

2. In March 1995, the Advisory Council on the Environment (ACE) endorsed the selection of the location and interim use of the secondary AFRF at Sha Chau, on the condition, inter alia, that the construction of a permanent pipeline system would be expedited. The aim is, therefore, to be able to cease the supply of aviation fuel via the AFRF at Sha Chau as early as practicable; these facilities would thereafter be retained as a back-up system.
3. The practicable mitigation measures identified for Sha Chau both in the EIA and other environmental studies, including a bubble curtain to reduce noise emissions to the surrounding waters from the construction of the AFRF and a zero discharge strategy from the facilities, have been implemented. To date there have been no identifiable environmental impacts resulting from the construction of the AFRF, other than those reported in the EIA and related studies.
4. In line with their commitment to ACE, the Airport Authority (AA) commenced the studies on a permanent AFRF and pipeline, which are now being undertaken by Montgomery Watson on behalf of the AA, and has been taking them forward in close consultation with the Government. A brief update was provided to ACE in November 1995, when the AA indicated that a number of alternative locations for an AFRF and pipeline routes had been identified and that work was proceeding.

## The Process

5. The study has, since then, made further progress. The EPD have established a Study Management Group (SMG) and a range of possible options has been identified and reviewed by the SMG. Eleven options were considered by SMG to be suitable for further assessment under the study. These are shown on Figure 1. Ten involve a bored underground tunnel to carry the pipeline to the new airport : the eleventh involves a pipeline route (which is part surface trenched and part bored tunnel) based on an earlier proposal presented by the Aviation Fuel Supply Consortium (the current fuel franchisee for Chek Lap Kok) whose shareholders include the fuel depot operators at Tsing Yi.
6. The following five main criteria with their respective weightings were endorsed by SMG and used in the assessment of these eleven options :

• Environmental Impacts	30%
• Technical/Programme	20%
• Statutory/Landuse	20%
• Commercial/Costs	20%
• Operations/Maintenance	10%
7. Under each of these main criteria a hierarchy of sub- and sub-sub-criteria was developed. Weightings against each were assigned and justified, then, following identification of possible options, marks were awarded against each criterion for each option.
8. If an option failed to meet 30% of the maximum score under any main criteria, or 50% of the maximum overall score, the option was not taken forward.
9. As the basis for the environmental part of this assessment a preliminary environmental appraisal has been carried out.
10. As a result, of the wide range of options thus considered under the study, only two options, namely an artificial island south of Lantau Island and a reclaimed area adjacent to Kau Yi Chau, both in Islands District, are considered suitable by the SMG to be taken forward at this time (see Figure 2).

11. It is intended that the studies should now incorporate any comment from Members of ACE. Thereafter, following the analysis of all comments received, the completion of any additional studies required and further consultation with Government, the resulting most favoured option would then be subject to public consultation, including a full Environmental Impact Assessment (EIA) and the normal gazettal process. A presentation has already been made to the Islands District Board who noted the available options and requested that the detailed EIA should particularly address the effects on nearby residents. A presentation has also been made to the Airport Consultative Committee (ACC), whose Members noted that there appeared to be no ideal solution. They thus broadly endorsed the view of Islands District Board. In particular, ACC Members advised that the next stage of the study should incorporate the following:

- assessment of the impact that a facility at Kau Yi Chau would have on the nearby residents (e.g. Discovery Bay) and on marine traffic in the nearby congested waters.
- (whilst a general preference for an artificial island south of Lantau was expressed) assessment of the potential impact on Indo-Pacific Humpbacked Dolphins and on the potential Marine Park.
- careful consideration of the commercial aspects of the options.

#### The Proposed Facilities

12. The proposed facilities are illustrated in schematic form on Figures 3 and 4 attached. They consist of :

- (a) An access channel together with a turning circle dredged to a depth of around 15 metres.
- (b) Two fuel unloading berths, each approximately 250 metres long, for vessels up to 60,000 dwt. These berths will be equipped with fuel unloading arms, fire fighting and other equipment.
- (c) A Supply and Emergency Response (SER) Base for support vessels, offices, services and the transfer pumping station, of approximately 2Ha.
- (d) Twin pipelines in a deep underground tunnel connecting to the new airport.

### Site Selection Considerations

13. Whilst it is difficult to single out specifics within a complex ranking process such as has been undertaken in the present studies, the main reasons why these two options (Figure 2) are selected in preference to the others (Figure 1) may be broadly summarised as follows:
- (a) The options allow vessels to reduce or avoid carrying aviation fuel through congested harbour areas en route to the berths.
  - (b) In terms of potential environmental impacts, the option of the artificial island was assessed as having the least potential environmental impact of all options examined, as it is considered to be more remote from sensitive receivers.
  - (c) Both options provide relatively simple systems comprising vessel access, twin berths, a transfer pumping station and twin pipelines in a bored tunnel.
  - (d) Neither need intermediate surface construction works, such as an access shaft or adit.
14. Arrangements for fuel delivery may also be affected by the progress of the Tong Gu Channel Project, which may open up alternative sea access routes in the area of the new airport.

### Construction and Operation

15. The AA would seek to ensure that both the construction and operation of the facilities would fully comply with all environmental guidelines and any agreed practicable mitigation measures that may be outlined in the future EIA.
16. When operational, the facilities would receive fuel delivered by tankers. The fuel would be immediately relayed via the twin underground pipelines to the existing tank farm on the airport island at Chek Lap Kok; no tanks would be needed for fuel storage at the AFRF itself. The facilities would be staffed around the clock to ensure adequate security is maintained. Measures would be adopted to minimise the remote risk of spillage and to respond effectively in the unlikely event of a leak or spill. In addition, unloading of fuel would cease when typhoon signal number 3 or higher is raised.

### Issues to be Addressed

17. Before construction could commence and indeed before a final decision could be made on the location of the AFRF, there are a number of issues that will require resolution in close consultation with Government. These include the need:
  - (a) to mitigate all the environmental and other concerns related to those sites;
  - (b) to secure, probably through private sector participation, the capital funding to cover the construction cost of the AFRF, estimated at HK\$1.8 to HK\$2.3 billion (in 1998 prices); and
  - (c) to maintain liaison with the airlines, who will be the users of the fuel system but who are, as yet, unconvinced of the need for the introduction of a separate permanent system to allow the AFRF at Sha Chau to revert to a back-up role as currently assumed.

### The Next Steps

18. The AA is endeavouring to meet the undertaking it and the Government gave in March 1995 to take forward the relevant studies on a permanent pipeline as expeditiously as possible. Allowing for the complex process of consultation that is required with Government and other parties, the AA hopes to be able to complete the current studies in the first half of 1997. The studies will at that stage need to have taken account of all potential impacts identified by ACE and other parties. There would then follow an EIA and the normal gazettal process for public comment.
19. It is envisaged that this process could be completed, and thus approval of the selected site secured, by perhaps late 1997 or early 1998. Thereafter site investigation, detailed design and construction could take a further three to four years.

### Consultation

20. The identified options for the new airport's permanent AFRF, as described in paragraph 10 above, have been drawn up following close consultation with all relevant Government departments and branches.

21. In view of the interest expressed previously by ACE Members in this matter, the AA now welcome the opportunity to present these options for the permanent AFRF to Members and to listen to any views Members may have on them.

Airport Authority  
October 1996

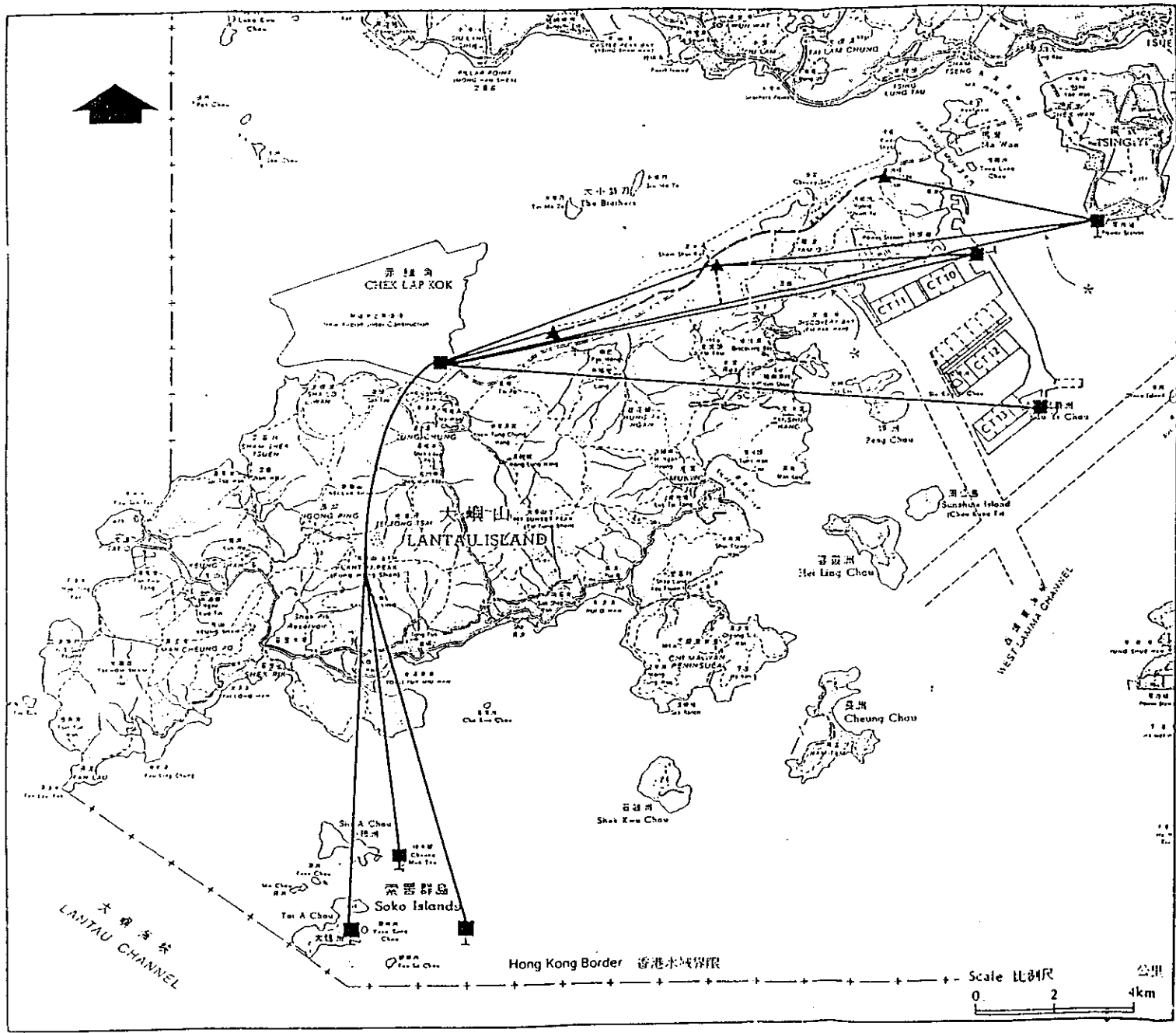


Figure 1  
Plan Showing the Eleven Options  
圖 1  
11 個選址及路線示意圖

- Legend 圖例**
- Pipelines in Deep Bored Tunnel  
深鑽挖隧道內的輸油管
  - - - Land Pipeline  
陸上輸油管
  - Terminal Shaft  
終端豎井
  - ▲ Intermediate Shaft  
中間豎井
  - · · Adit  
橫通道
  - ⊥ Jetty  
碼頭

**Note**  
Routes marked with an asterisk \* represent two options; one with and one without, an adit  
兩個選址及路線 \* 連及不連橫通道

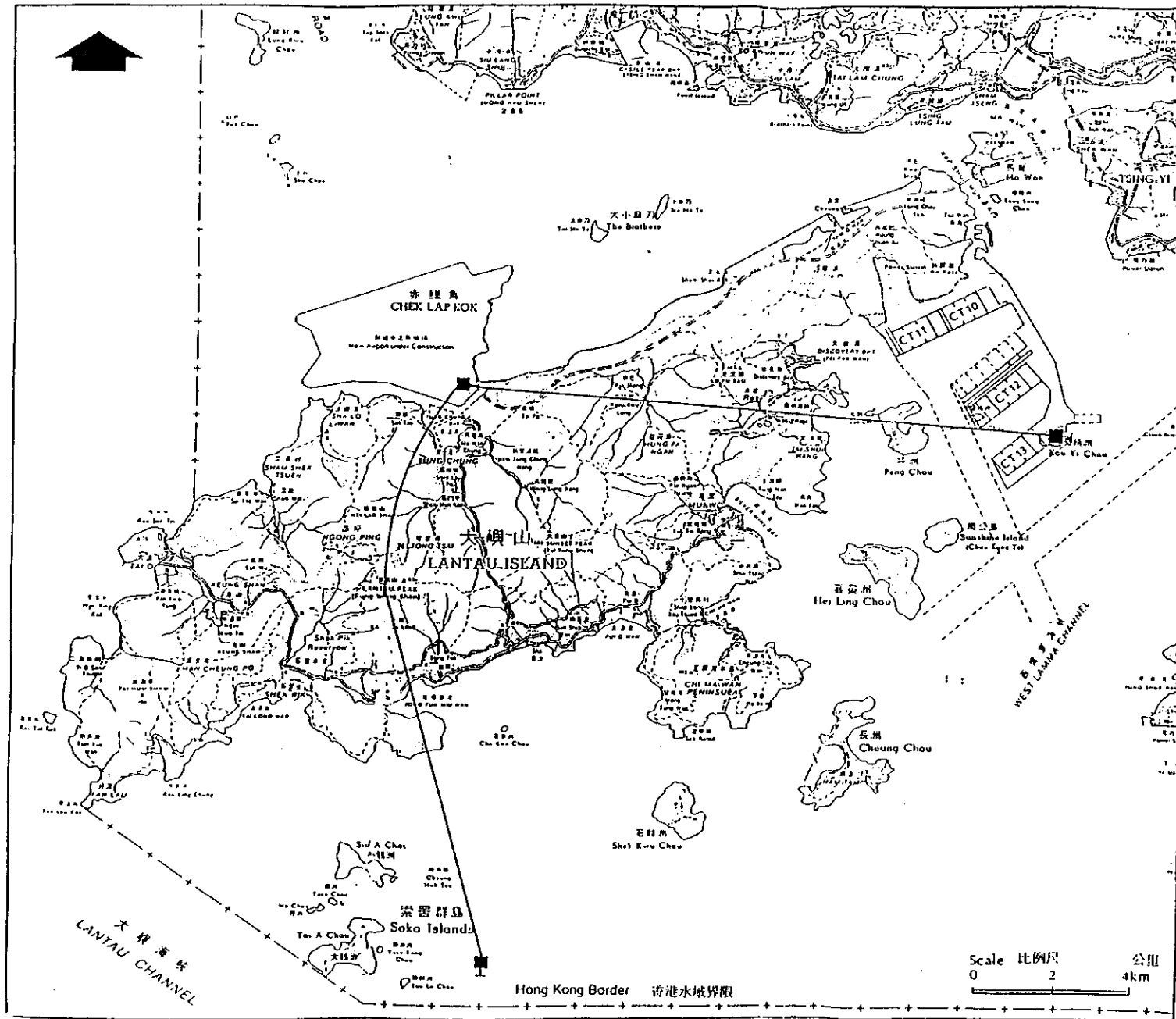


Figure 2  
 Plan Showing the Two Options  
 Currently being Taken Forward  
 圖 2  
 現正進一步考慮的兩個  
 選址及路線示意圖

- Legend 圖例
- Pipelines in Deep Bored Tunnel  
深鑽挖隧道內的輸油管
  - Terminal Shaft  
終端豎井
  - ⊥ Jetty  
碼頭



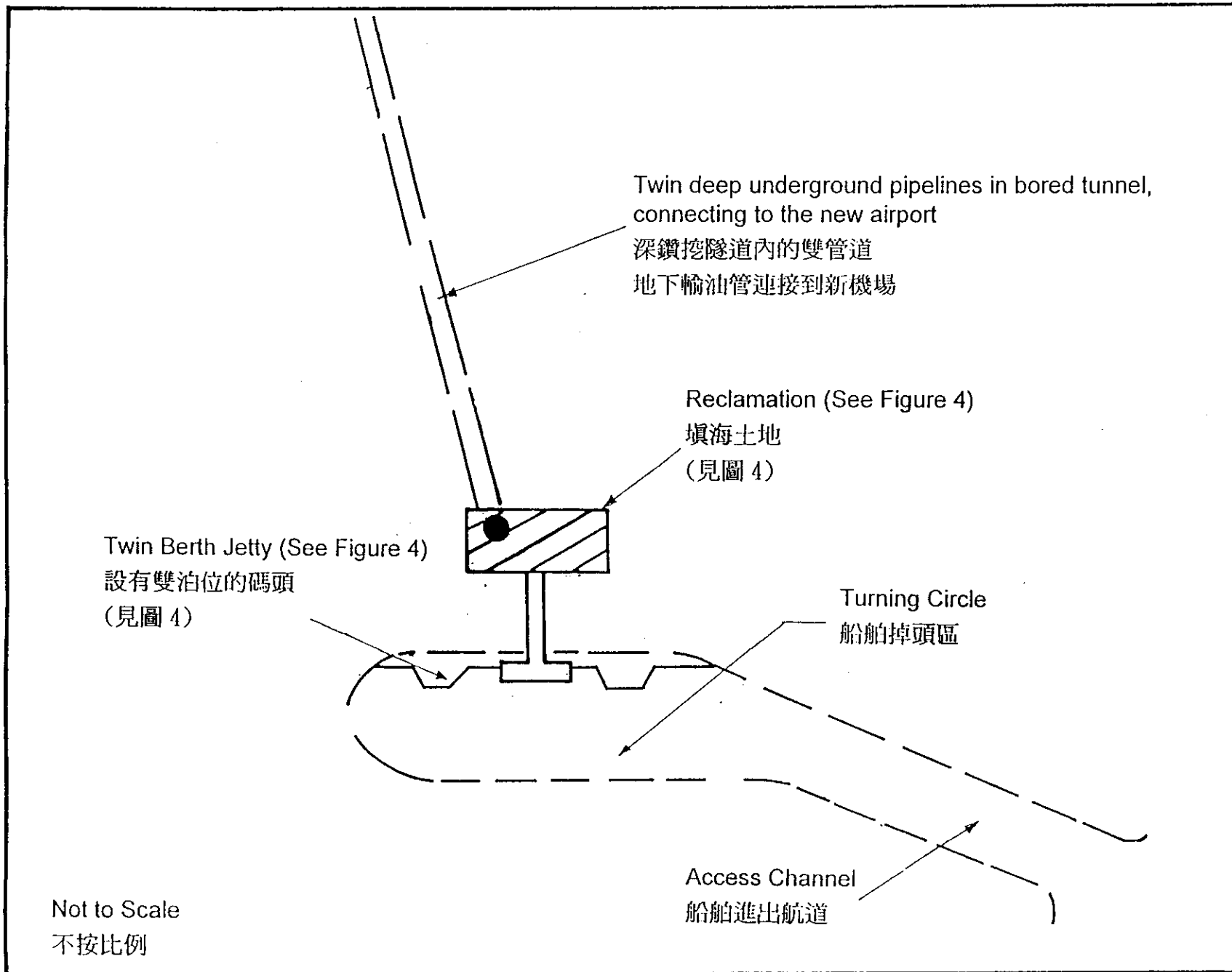


Figure 3  
Conceptual Layout of  
Access Channel and  
Turning Circle

圖 3  
船舶進出航道及  
船舶掉頭區的  
構思設計



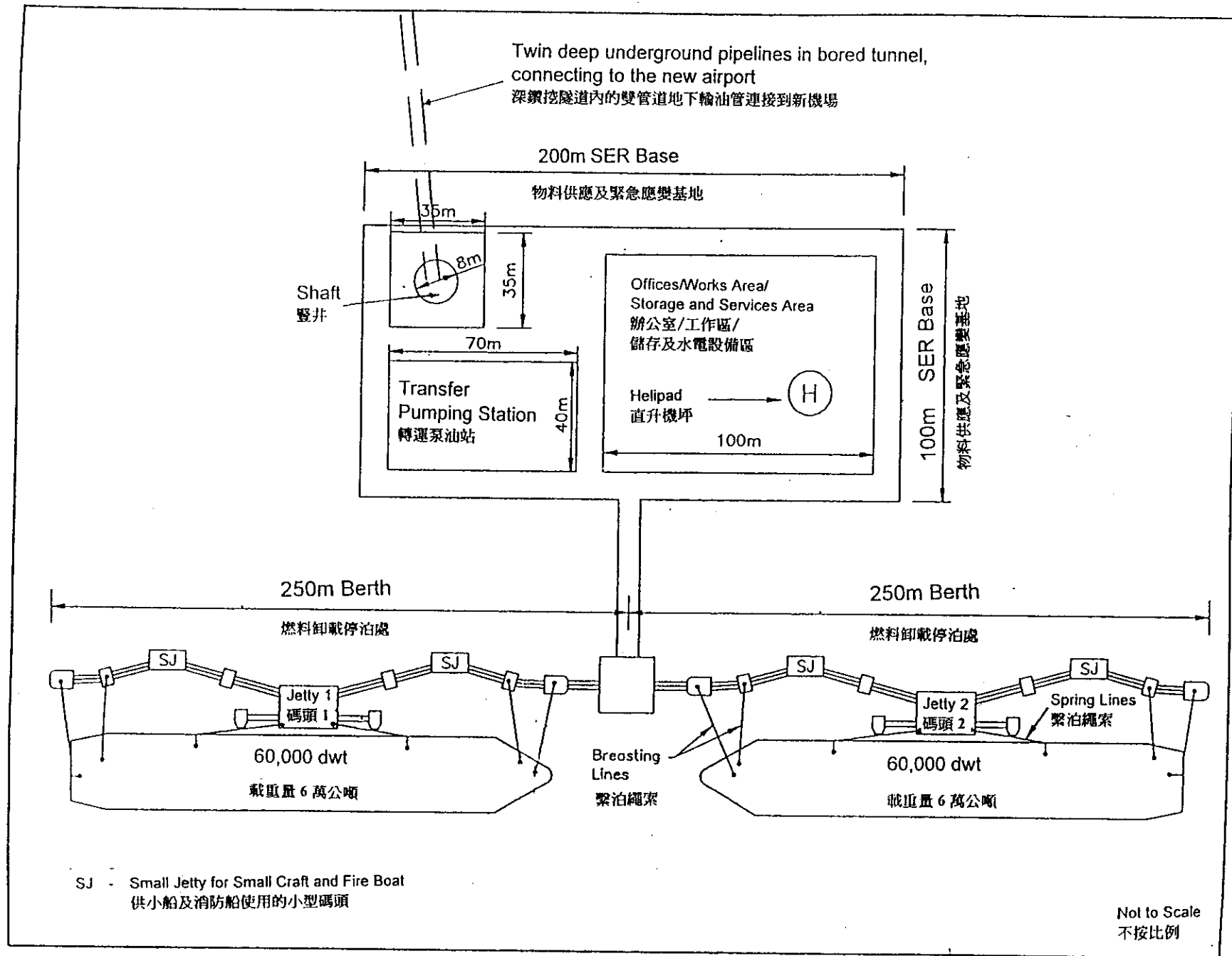


Figure 4  
Conceptual Layout  
of the Facilities

圖 4  
設施的構思設計

