



The Royal Hong Kong Jockey Club  
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 Environmental Protection Department



# The Hong Kong Golf Centre - Kau Sai Chau



Environmental Summary Report For  
 the Advisory Committee on the Environment (ACE)  
 March 1995



AXIS Environmental Consultants Limited

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**THE HONG KONG GOLF CENTRE KAU SAI CHAU  
ENVIRONMENTAL SUMMARY REPORT  
FOR THE ADVISORY COMMITTEE ON THE ENVIRONMENT (ACE)**

**4 MARCH 1995**

**INTRODUCTION**

At their meeting on 16 May 1994 the Advisory Committee on the Environment (ACE) endorsed the EIA for the Jockey Club Kau Sai Chau Public Golf Course subject to certain conditions.

The Club have already implemented the conditions as follows :

- |    |                                   |   |   |
|----|-----------------------------------|---|---|
| A. | Implementation of EIA             | - | In progress   |
| B. | Additional Ecological Survey      | - | Complete  |
| C. | Report to ACE's EIA Sub-Committee | - | Herewith  |
| D. | Bomb Damage Repairs               | - | The Club have instructed the Contractor to repair and landscape all bomb damaged areas which are adjacent to the golf course works, as well as damaged areas with easy access. Areas remote from our works are difficult to repair without causing major damage to adjacent undisturbed areas.  |
| E. | Zero Emission Vehicles            | - | Our Purchasing Department have researched the available zero emission vehicles and found that these are still at the prototype stage. We shall not be able to use these if our operation of the course is carried out properly but we shall be prepared to use available prototypes on the island on the basis of assisting ongoing research. |
| F. | Other developments                | - | Outside Club control.   |



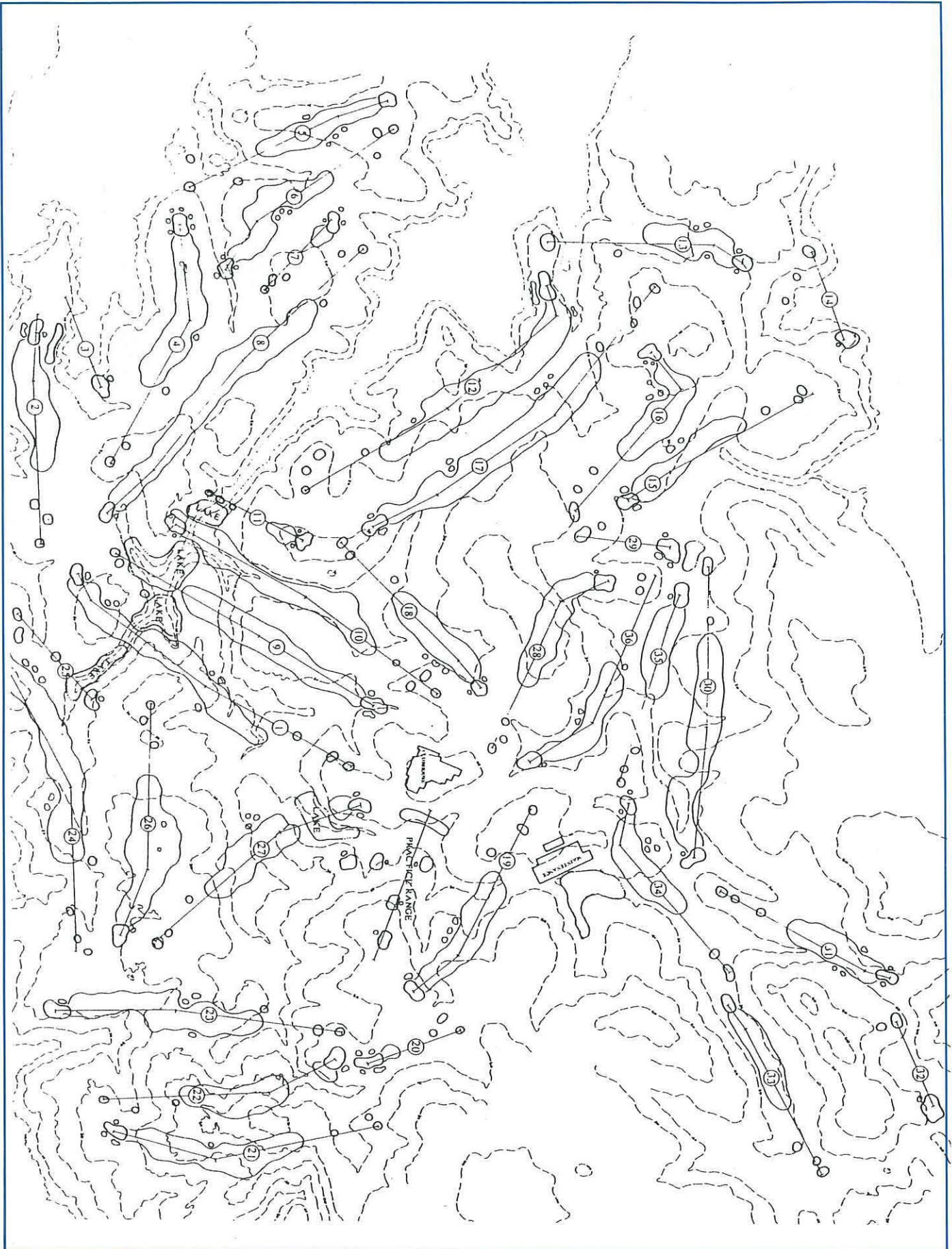


Figure 1. The Royal Hong Kong Golf Club Master Plan





## GENERAL PROGRESS

This report summarises the environmental input on the above project since the commencement of construction in May 1994. The specific project details are not repeated in this report to avoid unnecessary duplication.

The EIA report was endorsed by the ACE on the 16th May 1994, subject to certain conditions to be met by the project proponent (i.e Government/The Royal Hong Kong Jockey Club). One of the conditions is to report back to ACE, which is the purpose of this summary report.

In the early months of the project the environmental work focused largely on the mangrove area in the Kwat Tau Tam inlet. This area had been identified as a source of mangrove droppers/seedlings that would be lost once construction started in earnest. At the same time the environmental team worked in close association with the Contractor to prevent any unnecessary damage to natural vegetation. As the course holes were marked out further potential savings in terms of habitat became apparent. One particular area of interest was a wetland habitat close to the tee box for hole 15. This was identified early in the construction phase as a key habitat area to conserve if at all possible.

In addition to the above work, routine water quality monitoring of the marine environment around the island was on-going at six locations. The frequency of monitoring was three times per week at two tides (mid-ebb and mid-flood), at three depths and at the six locations. This was considered to be comprehensive in terms of parameters tested and frequency of testing. The first complaint relating to water quality was made in May 1994 by Kau Sai Chau mariculturists. Following this a representative from Agriculture and Fisheries Department (AFD) visited the site to inspect the works and the nearby Fish Culture Zones. Both the visit by AFD and the monitoring results confirmed that the project was having no impact on marine water quality. Further complaints were received in the first six months from the same complainant, non of which were substantiated.

A further environmental issue that was tackled early in the construction was the preservation of an area of mangroves situated immediately north west of the dam alignment. Protection of this area required lengthy discussion with the Contractor and the Dam Engineer, Mr Peter Seyler, in order to finalise the work programme and method statement for the downstream cofferdam.

As the above work continued on-site the environmental team were also pre-occupied with discussions with Friends of the Earth (FOE) and with the World Wide Fund for Nature, Hong Kong (WWF). WWF's objection to the project under the Foreshore and Sea bed (Reclamations) Ordinance with respect to the construction of the dam, necessitated detailed support work from the environmental team.

Further to ecological concerns raised, an Additional Ecological Survey was undertaken and the report was submitted in July 1994. The report concluded that the wetland habitat adjacent to hole 15 was a particularly good area for dragonflies, and every effort should be made to conserve this area. Figure 1 provides a plan of the project area showing the location of each individual golf hole.

In July 1994 FOE lodged an objection to the project under the Foreshore and Sea Bed (Reclamations) Ordinance. This prompted further meetings with AFD, other Government Departments and with FOE themselves to re-iterate the objectives of the project. This further objection after WWF had withdrawn their objection, resulted in a serious delay in project progress in relation to the dam. AXIS prepared a detailed response to the objection which was forwarded to all concerned parties on the 25th July 1994.

A draft Landscape Master Proposal was submitted in August 1994 for comment. This illustrated the landscaping works and reinforced the general principle to utilise existing native vegetation and avoid significant landscaping works except around the clubhouse.



## ENVIRONMENTAL MONITORING AND AUDIT

A condition of the project approval is to report to the Environmental Protection Department (EPD) on a monthly basis via the submission of environmental monitoring and audit reports. In addition, regular meetings have been held with EPD both on and off-site. The monthly monitoring reports provide a summary of the key construction activities, monitoring results and interpretation, and report on any related environmental matters. The remainder of this report highlights key points from the monthly Environmental Monitoring and Audit reports and from the Contractors monthly progress reports up to March 1995.

### Reporting Period July 1994:

The key point to note was the progress made on mangrove transplanting and nursery establishment. Experimental transplants and subsequent experience indicated that only the smallest of seedlings had a chance of being successfully moved. All transplants at this point in time were of *Bruguiera gymnorrhiza* seedlings, this species being perceived as having a higher conservation status than other mangroves in Kwat Tau Tam. By the end of July approximately 150 plants had been moved.

**Nursery Programme:** This programme was the main thrust of the mangrove mitigation plan, and was run concurrently with the transplanting programme. Ripe propagules were collected from the parent plants and planted in small paper cups. Once the droppers had sprouted, and reached the 4-6 leaf stage they were planted in various sites around the island. Both *Bruguiera* and *Kandelia* were successfully cultivated in this way, again with the emphasis on *Bruguiera*.

By the beginning of August 1994 over 400 *Bruguiera* and 150 *Kandelia* propagules were in the nursery, and a reserve of propagules of both species was being kept in water at the Ecosystems Lab in Aberdeen.

### Reporting Period August 1994:

Several stands of vegetation were staked out on the site for their protection during the construction.

Design changes to hole 15 were initiated in order to conserve the wetland area identified as a valuable habitat for dragonflies and other wildlife.

The planting of *Kandelia candel* and *Bruguiera gymnorrhiza* was conducted at four sites around the island. By the end of August over 2,200 transplants, seedlings and propagules had been planted.

Heavy rain in August disrupted work on site considerably. Despite this bulk earthworks were completed for hole 2, and works commenced on holes 3-8 and the formation of the access/haul roads for holes 21, 22 to holes 33 and 34. No impacts on marine water quality were recorded.

### Reporting Period - September 1994:

Two additional bird species were recorded on the site, a grey tailed Tattler and a Black - Capped Kingfisher. Over the winter period no further mangrove planting was attempted, however, monitoring of growth rates and survival status was carried out.

On the 27th September Exco overruled FOE's objection to the project and work commenced on the dam and associated works such as the box culvert and the temporary access roads.

On the courses, shaping was completed on hole number 2 and was well advanced on hole 4.

Excavation for the clubhouse foundations was virtually finished and drilling and blasting works had commenced. Heavy rains during September continued to disrupt progress with the bulk earthworks.

**Reporting Period - October 1994:**

In October construction work moved into full operation owing to the predominantly dry and sunny weather. The design of hole 15 was modified to the satisfaction of all parties concerned. A geotextile wall was included in the design to support the adjacent fairway and protect the wetland area.

Monitoring of mangroves demonstrated survival rates ranging from 32 to 100 % with a large proportion of mortality attributable to crabs feeding on the leaves. This was consistent with scientific literature relating to natural survival rates.

**Reporting Period - November 1994:**

In November a licence was obtained from the EPD under the Dumping at Sea Act 1974.

Construction of the extended portion of the downstream cofferdam commenced on the 9th November as required to protect the area of existing and planted mangroves downstream of the main dam. AXIS worked closely with the Contractor and the Dam Engineer to ensure a suitable marine water supply to the mangrove area. This is shown in Plate 2 (discussed below).

On the golf course bulk earthworks were completed for holes 2,3,4,5,6,7 and 8 and shaping completed on holes 2,3 and 4.

Water quality monitoring continued without any significant impact on the marine environment being recorded. As the project progressed into the dry season AXIS recommended a reduction in the frequency of sampling in order to concentrate resources for on-site supervision.

**Reporting Period - December 1994:**

In December the main construction activities included excavation for the main dam foundations; earthworks, shaping and drainage installation for the golf courses; and the construction of drainage and foundation work for the clubhouse. Photographic Plate No.1 shows the main dam excavation work and the alignment of the downstream cofferdam.

Protection of the mangroves in front of the main dam was proving very successful. The survival and growth of these plants was monitored on a regular basis, including inspection of the marine water supply. The mangrove conservation work represents a good example of positive environmental protection work in Hong Kong. Photographic Plate No.2 shows the mangrove area and the channel feeding in the salt water supply.

Construction commenced on the geotextile wall at hole 15, and this work is progressing well without any impact on the adjacent wetland. Photographic Plate No.3 shows the area in question and the construction in progress. This is a further example of significant environmental achievement for the project.

Results from the mangrove transplanting work indicate that the planting has achieved a better or equivalent survival rate to that expected from natural transplantation. No further planting was planned for the winter season with resources focused on preparing a new substrate for compensation planting. The new substrate was to be created from sediment excavated for the main dam.





**Reporting Period - January 1994:**

By January planting works were completed to holes 2,3 and 4. Irrigation and drainage works were completed for holes 5,6 and 7 and greens 5 and 6 were piped and tiled. Final shaping was underway on holes 24, 25, 31 and 32. Golf course work was continuing without impacting on those areas of natural vegetation outside the playing surface. These natural areas will be retained as a central part of the golf course landscape. Photographic Plate No.4 providing a view down hole 31, illustrates the success of the project in minimising disturbance to natural vegetation outside of the golf playing area.

Good progress was made on the main dam excavation and this work was continuing ahead of schedule. AXIS supervised the placement of sediment in a lagoon area immediately north of the downstream cofferdam. This area will be the focus of attention over the coming months as the substrate is prepared for planting in the summer.

**Reporting Period - February 1995:**

In February a summary report on the Embankment Dam Construction was prepared by the Dam Engineer, Mr Peter Seyler and issued to EPD. This was an important document as it detailed the approach and programming for the dam construction and demonstrated how the environmental work related to this.

Also in February preliminary meetings were held between AXIS, EPD and AFD to define the operational Environmental Monitoring and Audit (EM&A) Requirements. If completed to the current programme the operational EM&A manual will be drafted by the end of April 1995.

Earthworks concentrated on completion of holes 10, 11 and 18 and were programmed to finish by the end of March.

Holes 24 and 25 were shaped and are awaiting final preparation and placing of sand prior to turfing.

**Reporting Period - March 1995:**

In this current month the environmental team are focusing on practice mitigation measures in anticipation of the rainy season. For example, a bund has been established along the edge of the temporary access road to prevent direct surface runoff to marine water; enlargement of the sedimentation pit to ensure it functions correctly during heavy rains; hydroseeding of exposed areas adjacent to the wetland area to prevent siltation of this sensitive environment.

In addition, measures are underway to connect wastewater from the canteen to the soakaway system for the temporary toilets. The soakaway has not been functioning effectively and is therefore to be enlarged.

Detailed planning for the planted mangrove area will begin this month. An important factor under discussion will be the depth of sediment required to obtain acceptable tidal levels for mangrove plants. Mud flat areas will also be created to attract bird life to the island. The aesthetic value of this area will be a major consideration as it will be visible from a number of key view points.



**Plate 1**

**Shows the downstream cofferdam alignment and the excavation work for the main dam foundations**



**Plate 2**

**The mangrove area immediately north of the main dam. Showing the input channel providing a tidal supply of salt water**





**Plate 3**

**Preliminary work on the construction of a supporting geotextile wall at hole 15. Showing the marsh/wetland area and associated shrubs which will remain undisturbed.**



**Plate 4**

**A view down hole 31 illustrating the success of the project objective to minimise disturbance to natural vegetation outside the golf playing area**

