

CHAPTER 8

THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

CAPITAL WORKS RESERVE FUND

GOVERNMENT SECRETARIAT

Works Bureau

GOVERNMENT DEPARTMENTS

**Architectural Services Department
Government Flying Service
Hong Kong Police Force**

Construction of the Government Flying Service Headquarters

**Audit Commission
Hong Kong
20 March 2002**

CONSTRUCTION OF THE GOVERNMENT FLYING SERVICE HEADQUARTERS

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CONSTRUCTION OF THE GOVERNMENT FLYING SERVICE HEADQUARTERS

Summary and key findings

A. **Introduction.** In October 1995, the Architectural Services Department (ArchSD) awarded a contract (the Contract) to a contractor (the Contractor) for the design and construction of a new Government Flying Service (GFS) Headquarters at Chek Lap Kok. The Contract was scheduled for completion in July 1997. In the event, it was substantially completed in June 1998 (paras. 1.3 and 1.6).

B. **Audit review.** Audit has recently carried out a review of the construction of the GFS Headquarters (para. 1.9). The audit findings are summarised in paragraphs C to H below.

C. **Delayed handover of part of the GFS site.** In September 1994, a year before the award of the Contract, the GFS informed the ArchSD that it would require two helipads. However, it was only in June 1995 that the ArchSD informed the Airport Authority (AA) that an extension of the GFS northern site boundary would be necessary to accommodate the two helipads within the GFS site. In September 1995, the AA agreed to the proposed extension. However, there was no binding agreement between the AA and the Government for the timely handover of the extension area. After the commencement of the Contract in October 1995, the ArchSD had made considerable efforts to seek AA's confirmation for the timely handover of the extension area, but the efforts were in vain. Due to the delay in the handover of the extension area and the presence of AA's communication ducts and draw pit in the area, the Contractor's works were delayed. The ArchSD had to grant an extension of time (EOT) and pay a prolongation cost to the Contractor (see para. D below). Audit considers that the ArchSD should have sought an early agreement from the AA for extending the GFS site boundary and secured a firm handover date of the extension area before the letting of the Contract (paras. 2.6, 2.12 and 2.13).

D. **Late finalisation of apron layout requirements.** As early as September 1995 (i.e. immediately before the award of the Contract), the GFS had been considering the revision of the apron layout so that it could gain operational improvements and have flexibility in the use of the apron area. However, the GFS only finalised its apron layout requirements eleven months later. Because of the late finalisation of the apron layout, the ArchSD had to grant an EOT and pay a prolongation cost (a total of \$4.8 million due to the revision of the apron layout and the extension of the site boundary – see para. C above) to the Contractor. In order to avoid delay and the payment of a prolongation cost due to late changes in requirements, Audit considers that the ArchSD should have required the GFS to finalise its apron layout requirements before an agreed cut-off date (paras. 2.18 and 2.30).

E. **No arrangement for fuel supply was made with the AA before requesting additional facilities.** In August 1996, the GFS requested the provision of an additional tanker refuelling station and additional pipework. In March 1997, the ArchSD instructed the Contractor to construct the additional facilities. The intention of the GFS was that it would enable the supply tankers of the AA's franchised fuel supplier to fill the GFS underground fuel tanks from the airside without entering the GFS active apron area. However, Audit notes that the AA's franchised arrangement for the regular supply of aviation fuel does not cover the GFS, and no alternative fuel supply arrangement has been made for the supply of aviation fuel to the GFS in emergency situations. Audit considers that the GFS

should have made a firm arrangement with the AA for the supply of aviation fuel before instructing the Contractor to construct the additional facilities in March 1997 (paras. 3.3, 3.6, 3.8, 3.14 and 3.15).

F. **Substantial changes to room layout and related building services provisions.** The Hong Kong Police Force (HKPF) is provided with small-scale accommodation within the GFS Headquarters. In early July 1996, the HKPF commented on the revised building plans of the HKPF accommodation. Thereafter, the HKPF requested changes to the room layout and the related building services provisions. After the approval of the final design building plans by the ArchSD in October 1996, the GFS also requested changes to the room layout and the related building services provisions of the GFS accommodation. Consequently, the Contractor's works were delayed. The Government had to pay a prolongation cost of \$3.9 million to the Contractor. Audit considers that both the HKPF and the GFS should have fully considered and finalised their design requirements at an early stage. Audit also considers that the ArchSD should have agreed with the HKPF and the GFS a cut-off date for finalising their design requirements, so as to ensure that the Contractor was provided with sufficient time to complete the final design building plans (paras. 4.6, 4.12, 4.13, 4.16 and 4.20).

G. **Other late changes and additional works.** Before and especially after the extended contract completion date of 16 November 1997, the HKPF and the GFS requested other changes and additional works, involving mainly building services works and builder's works. In addition, there was a significant lapse of time between the date on which the HKPF and the GFS requested the changes and the additional works, and the date on which the ArchSD issued the instruction to the Contractor to carry out the works. The ArchSD had to pay a prolongation cost of \$5.1 million to the Contractor. Audit considers that if the ArchSD had issued its works instruction within the shortest possible time after the user departments requested the changes and additional works, the Contractor would have been able to complete the additional works much earlier. Audit also considers that the ArchSD, together with the user departments, should have ensured that requirements for the additional works were finalised before an agreed cut-off date, so as to provide the Contractor with sufficient time to complete the required works (paras. 5.1, 5.2, 5.12 and 5.13).

H. **Re-coating of the GFS hangar floor.** According to the Contract, the GFS hangar floor should be coated with epoxy paint. The epoxy paint was colourless, but colouring was available on request. The GFS preferred the hangar floor coating to be in an off-white colour. However, no floor colour requirement was indicated in the data sheets compiled by the GFS in March 1995. In the event, the ArchSD endorsed the use of the epoxy paint without specifying any colour and without confirming with the GFS. The hangar floor was painted with a transparent epoxy coating which resulted in a concrete-grey colour finish. The GFS considered that the grey colour was too dark for engineering and repair work. The hangar floor had to be re-coated at an extra cost of \$1.4 million. Audit considers that the GFS should have clearly stated in the data sheets the floor colour requirement for the hangar and, if necessary, followed up in writing with the ArchSD. Audit also considers that the ArchSD should have confirmed with the GFS before authorising the Contractor to use the particular epoxy paint (paras. 6.2, 6.3, 6.8, 6.10 and 6.11).

I. **Audit recommendations.** Audit has made the following main recommendations:

(a) the Director of Architectural Services should:

(i) when negotiating with a third party (e.g. the AA) concerning the handover of a site for a government contract:

- resolve issues relating to the handover of the site before the letting of the contract so that the site can be made available before the commencement of the works (para. 2.14(a)); and
 - obtain a binding agreement from the third party concerned so that it can be held responsible for reimbursing the Government any prolongation cost arising from its failure to hand over the site on time (para. 2.14(b));
- (ii) in implementing a design-and-build contract:
- require the user department to finalise its design requirements before an agreed cut-off date so as to ensure that the contractor is provided with sufficient time to complete the final design work (paras. 2.31(a) and 4.21(a)); and
 - if the user department requires changes to the design requirements after the agreed cut-off date, which may have time and cost implications, critically assess the user department's need for such changes (paras. 2.31(b) and 4.21(a));
- (iii) promptly instruct the contractor to implement any additional works which are essential for the completion of a contract (para. 5.14(b)); and
- (iv) before applying a construction material which is considered operationally critical to a user department, request the contractor to provide samples for examination and selection (para. 6.12(b));
- (b) the Controller, Government Flying Service should:
- (i) before requesting the provision of any additional facilities with significant cost implications, ensure that necessary arrangements are made with the third parties concerned to enable the GFS to use the facilities as intended (para. 3.16(a)); and
 - (ii) expedite action to acquire an alternative supply of aviation fuel for the GFS in emergency situations (para. 3.16(b));
- (c) as the users, the Controller, Government Flying Service and the Commissioner of Police, should finalise the design requirements before the agreed cut-off date set by the works department, especially if the works are to be carried out by a design-and-build contract (paras. 2.32 and 4.21(b)); and
- (d) the Secretary for Works should consider notifying all works departments and user departments of the audit recommendations made to the Director of Architectural Services (see inset (a) above), so as to avoid any recurrence of similar cases in future (para. 6.16).

J. **Response from the Administration.** The Administration has generally agreed with the audit recommendations (paras. 2.33, 2.34, 3.17, 4.23, 4.24, 5.15, 6.14, 6.15 and 6.17).

PART 1: INTRODUCTION

Construction of GFS Headquarters at Chek Lap Kok

1.1 The Government Flying Service (GFS) is a government department which provides flying services mainly for casualty evacuation, search and rescue, fire fighting, and police operations. It operates a fleet of eleven aircraft, comprising nine helicopters and two fixed-wing aircraft.

1.2 Prior to 22 June 1998, the GFS Headquarters was located at the Kai Tak Airport. In January 1995, the Finance Committee upgraded to Category A (Note 1) the remaining parts of a Public Works Programme project for the provision of government facilities at the Chek Lap Kok Airport, which included the construction of a new GFS Headquarters. In March 1995, the Architectural Services Department (ArchSD) obtained approval from the Secretary for the Treasury for the invitation of tenders from a list of prequalified tenderers for the construction of the new GFS Headquarters. In June 1995, the ArchSD invited the tenders. As one of the new Airport's core projects, the timely completion of the GFS Headquarters was important for the overall completion of the new Airport (Note 2).

1.3 In October 1995, the ArchSD, on behalf of the Government (hereinafter referred to as the Employer), awarded a contract (hereinafter referred to as the Contract) to a contractor (hereinafter referred to as the Contractor) for the design and construction of the new GFS Headquarters. The ArchSD was responsible for administering the Contract.

Design-and-build contract

1.4 The Contract included the design and construction of a three-storey office building, workshops, an aircraft hangar and an aircraft apron with ancillary facilities. The GFS Headquarters was constructed under a design-and-build contract. Besides being able to fast-track the construction of a project, a major characteristic of a design-and-build contract is that a single contractor is employed to take ultimate responsibility for both the design and construction of the works. A tenderer for a design-and-build contract is required to submit Contractor's Proposals

Note 1: *Public works projects are classified into several categories under the Public Works Programme. Category A projects are projects which are ready in all aspects for tenders to be invited and for construction works to proceed, and which have approved project estimates.*

Note 2: *In June 1995, the Provisional Airport Authority targeted the opening of the new Airport for operation in April 1998. In January 1998, the Government announced that the new Airport would be open for operation on 6 July 1998. On that date, the new Airport was open for operation.*

(Note 3) to address the Employer's Requirements and the design concept drawings contained in the tender documents. A design-and-build contractor has to prepare the detailed design after entering into the contract and during the execution of the works. It is important that the ArchSD, in conjunction with user departments, specifies the Employer's Requirements clearly and adequately to enable the contractor to fulfil the Employer's Requirements without unnecessary delays and additional costs. If successfully implemented, a design-and-build contract would minimise claims from the contractor and achieve greater cost and time certainty because the contractor shoulders both the risk and the responsibility for the design and construction of the works.

1.5 However, in a design-and-build contract, claims from the contractor can arise:

- (a) **if the Employer does not clearly or adequately specify the Employer's Requirements; or**
- (b) **if the Employer makes significant changes to the Employer's Requirements or the design during construction. These are referred to as Employer's Changes (Note 4).**

Either one of the above occurrences can lead to delay in the completion of the works and the payment of a prolongation cost to the contractor, as can be seen in the construction of the GFS Headquarters.

Payment of prolongation cost and additional cost

1.6 Prolongation cost. The Contract commenced in October 1995 and was scheduled to be completed on 14 July 1997. In the event, the Contract was substantially completed in June 1998 (Note 5). An extension of time (EOT) of 199 days (Note 6) was granted to the Contractor for

Note 3: *Contractor's Proposals are proposals submitted by the contractor in response to requirements specified by the Employer, which form part of the tender, for the design and construction of the works. Similarly, the contractor is required to submit Contractor's Proposals in response to Employer's requests for changes to the specified requirements during the construction stage.*

Note 4: *Employer's Changes are written instructions given by the Employer to the contractor for variations in the design, quality or quantity of the works already specified in the Employer's Requirements and/or the Contractor's Proposals.*

Note 5: *The Contractor had to rectify outstanding defective works after the substantial completion of the project in June 1998. In October 2001, the ArchSD issued the Maintenance Certificate to the Contractor.*

Note 6: *The Contractor was also granted an EOT of 144 days for delay due to the lack of seawater for testing and commissioning of the air-conditioning system. However, pursuant to the General Conditions of Contract, the Contractor was not entitled to financial claims for the delay due to the non-availability of an adequate supply of seawater.*

delays due mainly to the Employer's Changes to the Employer's Requirements and the design. The ArchSD had to pay a prolongation cost of \$13.8 million to the Contractor for the EOT granted, as follows:

- (a) \$4.8 million due to extension of site boundary and revision of apron layout (see PART 2 below);
- (b) \$3.9 million due to revisions of room layout and related building services provisions (see PART 4 below); and
- (c) \$5.1 million due to other late changes and additional works (see PART 5 below).

1.7 **Additional cost.** In addition to the payment of prolongation costs to the Contractor, the GFS found that the colour of the hangar floor coating did not meet its operational requirements. In the event, the hangar floor had to be re-coated, at a cost of \$1.4 million, as improvement works by another contractor in 2001 (see PART 6 below).

1.8 **The sum of the prolongation cost (see para. 1.6 above) and the additional cost (see para. 1.7 above) amounts to \$15.2 million.**

Audit review

1.9 Audit has recently carried out a review of the construction of the GFS Headquarters. The objectives of the review are:

- (a) to evaluate the economy, efficiency and effectiveness with which the ArchSD, in collaboration with the user departments, had administered the contract for the construction of the GFS Headquarters; and
- (b) to ascertain whether there are lessons to be learnt and whether there is room for improvement in future contract administration and project implementation.

1.10 The audit has revealed that there are lessons to be learnt and improvements can be made in future contract administration and project implementation. Audit has made a number of recommendations to address the issues (see PART 2 to PART 6 below).

PART 2: EXTENSION OF SITE BOUNDARY AND REVISION OF APRON LAYOUT

2.1 This PART examines the delay arising from the extension of the site boundary (see paras. 2.3 to 2.13 below) and the revision of the apron layout (see paras. 2.16 to 2.30 below) due to Employer's Changes. Because of the delay, the ArchSD had to:

- (a) grant to the Contractor an EOT of 69 days (49 days for the extension of the site boundary and 35 days for the revision of the apron layout, of which 15 days overlapped);
- (b) pay a prolongation cost of \$4.8 million to the Contractor; and
- (c) revise the completion date of the Contract to 21 September 1997.

The audit has revealed that there are lessons to be learnt in contract administration and project implementation.

Location and boundary of GFS site

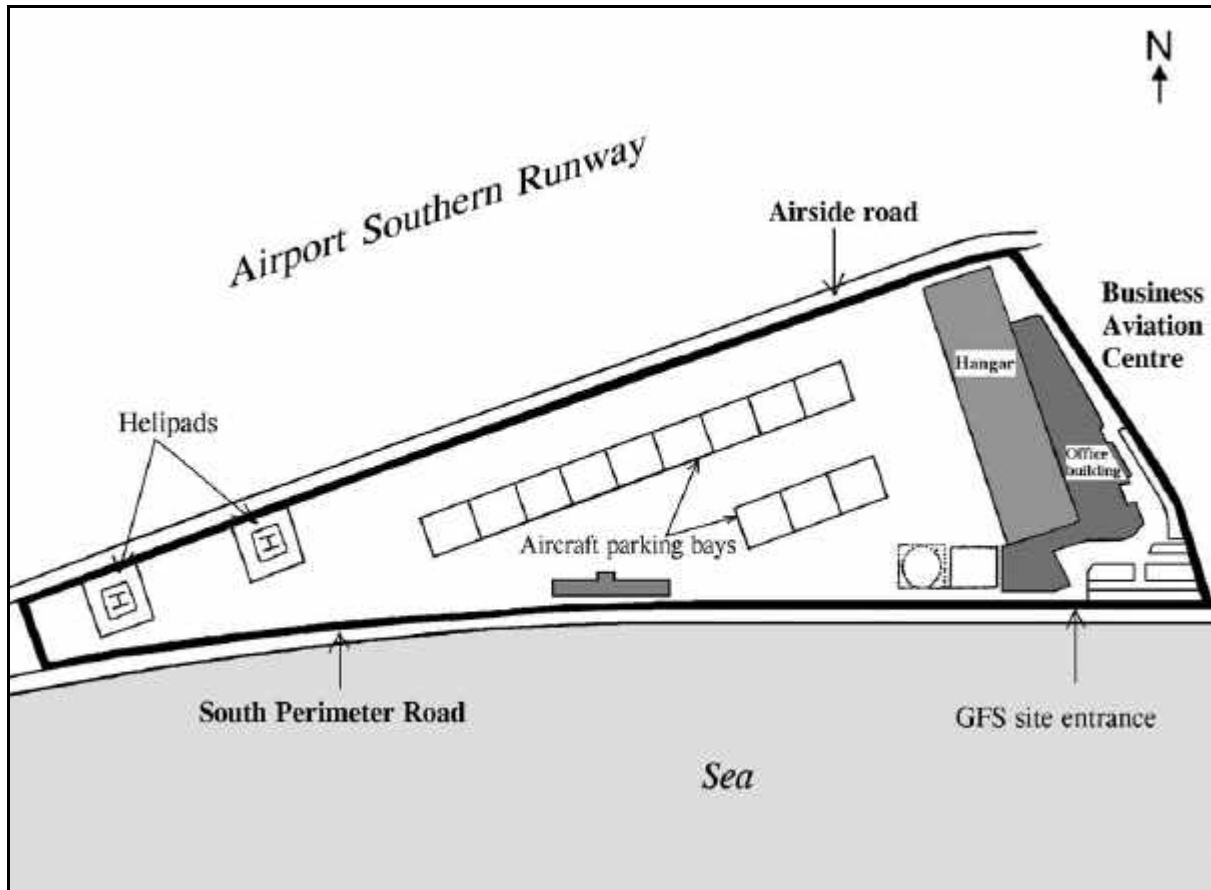
2.2 The GFS Headquarters site is located in the southwestern corner of the new Airport in Chek Lap Kok. It is bounded by:

- (a) an airside road along the northern boundary of the site (parallel to the edge of the Airport Southern Runway);
- (b) the Business Aviation Centre along the eastern boundary of the site; and
- (c) the South Perimeter Road along the southern boundary of the site.

The South Perimeter Road provides landside access to the GFS site. A map showing the boundary of the GFS site is at Figure 1 below.

Figure 1

**GFS site boundary
(para. 2.2 refers)**



Legend:  GFS site boundary

Source: ArchSD's records

Extension of site boundary

2.3 In October 1995, after the award of the Contract in the same month, the ArchSD informed the Contractor in writing of the GFS's intention to request an Employer's Change for extending the northern boundary of the GFS site (i.e. along the airside road) by eight metres. The extension:

- (a) would provide the necessary area to accommodate, within the site, the two helipads;
- (b) would widen the distance separation between parked aircraft and aircraft taxiing in the apron area; and
- (c) would accommodate the location of a tanker refuelling station at the northern boundary of the site near the hangar. This would obviate the need to use the apron area by fuel tankers.

2.4 The Airport Authority (AA – Note 7) had originally agreed to hand over the extension area by 4 November 1996. However, there was delay in the handover of the extension area by the AA. In addition, the drainage works in the extension area were delayed because the AA's communication ducts and draw pit were not compatible with the proposed location of the surface channel for one of the helipads. The ArchSD assessed that the Contractor was entitled to an EOT of 49 days and the payment of a prolongation cost (see para. 2.1 above). Details are given in paragraphs 2.5 to 2.13 below.

Provision of two helipads within the GFS site

2.5 The main purpose of extending the northern site boundary was to give the GFS the necessary area to accommodate two helipads within the site (see para. 2.3(a) above). The sequence of major events in the provision of the two helipads is given in Table 1 below.

Note 7: *The AA was established on 1 December 1995, under the Airport Authority Ordinance (Cap. 483), with full statutory powers to operate, develop and maintain Hong Kong's new Airport.*

Table 1
Sequence of major events in
the provision of two helipads within the GFS site
(para. 2.5 refers)

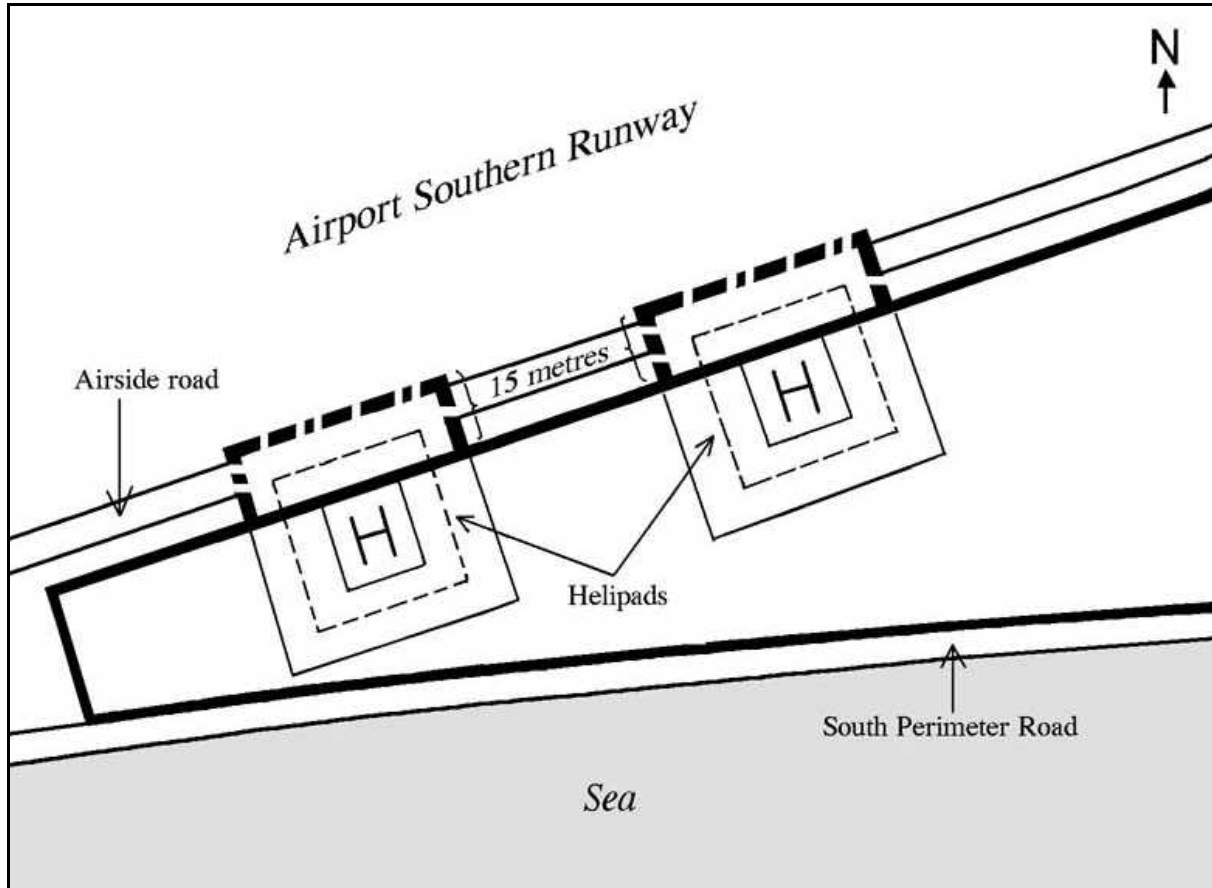
	Date	Events
(a)	September 1994	The GFS advised the ArchSD that it would require two helipads because it was essential to have one helipad on standby for its helicopter operations.
(b)	December 1994	The Provisional Airport Authority (hereinafter referred to as the AA – Note) and the Civil Aviation Department (CAD) agreed to the provision of two helipads on the condition that there should be adequate distance separation between the southern edge of the Airport Southern Runway and the helipads.
(c)	February 1995	The ArchSD received confirmation and drawings from the GFS regarding the agreement between the AA and the GFS over the provision of two helipads.
(d)	April 1995	The ArchSD forwarded to the AA a site plan indicating the location of the two helipads. The AA confirmed that it would incorporate the two helipads into the Airport Site Plan.
(e)	June 1995	The ArchSD sought agreement from the AA for extending the GFS northern site boundary by 15 metres (subsequently reduced to eight metres – see Item (g) below) so that the two helipads would be situated wholly within the GFS site. The proposed extension is shown in Figure 2 below.
(f)	June 1995	The AA said that it could not agree to the proposed extension, as it would encroach onto the airside road. The AA considered that, in respect of airfield operations, the airside road must be kept clear of GFS operational activities so as to maintain unimpeded vehicle movements.
(g)	July 1995	The ArchSD, after consultation with the GFS, reduced the size of the helipads and sought the AA's agreement to extend the site boundary by eight metres to accommodate the two helipads.
(h)	September 1995	The AA agreed to the extension of the GFS northern site boundary by eight metres to the southern edge of the airside road.
(i)	October 1995	The Contractor commenced the contract works.

Source: ArchSD's records

Note: The Provisional Airport Authority was established in 1990. It was reconstituted as the AA in December 1995 (see Note 7 to para. 2.4 above).

Figure 2

**Proposed extension of the northern boundary of the GFS site
(Item (e) of Table 1 refers)**



Legend: Original site boundary before September 1995
 Proposed extension

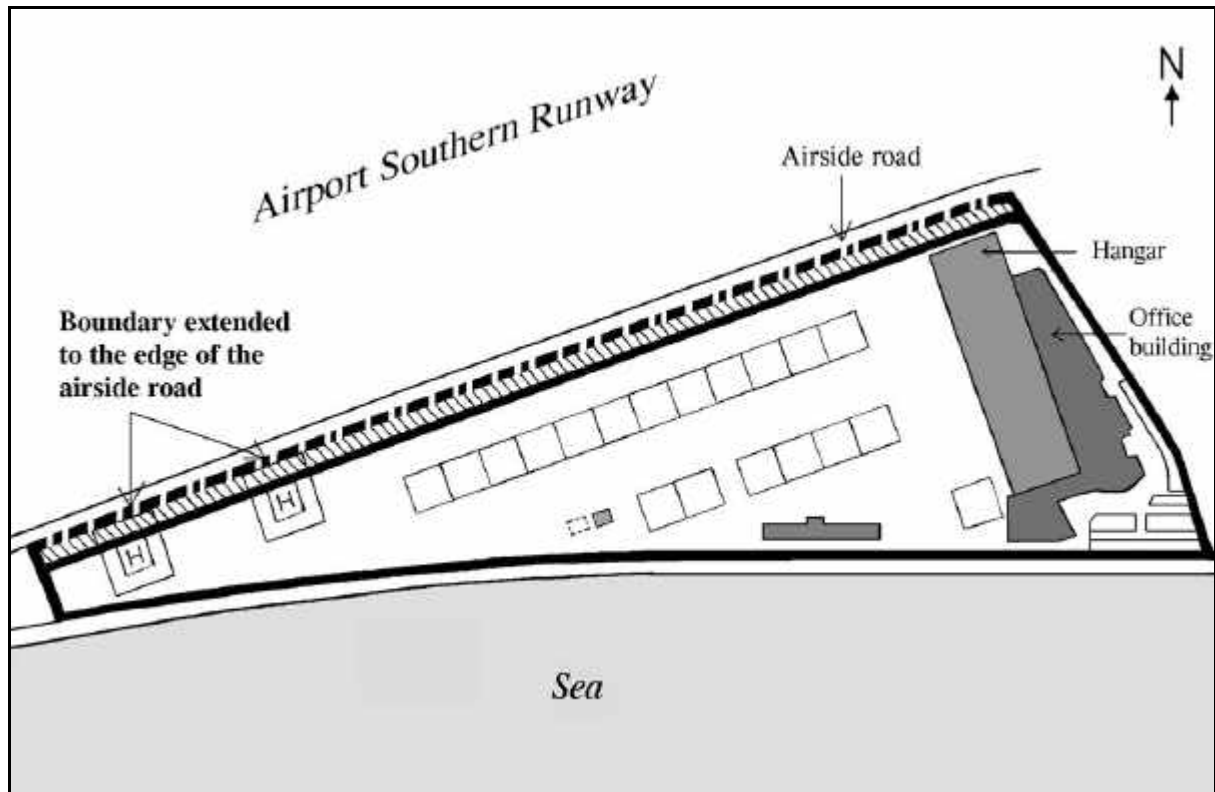
Source: ArchSD's records

Extension of the entire length of the northern site boundary

2.6 On 20 September 1995, the AA agreed to the extension of the GFS northern site boundary by eight metres to accommodate the two helipads. A map showing the agreed extension is at Figure 3 below.

Figure 3

**Extension of the northern boundary as agreed by AA on 20 September 1995
(para. 2.6 refers)**



Legend:

- Original site boundary
- - - Extended site boundary
- ▨ Eight-metre wide extension area

Source: ArchSD's records

2.7 In September 1995, the GFS informed the ArchSD that it preferred to extend **the entire length of the site boundary northwards**. The GFS considered that this would allow flexibility in the use of the apron area and improve its operations.

Delayed handover of the extension area

2.8 In late September 1995, the AA informed the ArchSD that it would hand over the GFS site to the ArchSD upon the commencement of the Contract in October 1995. As regards the extension area, the AA said that its contractor would fill up the trench in the area (at that time under excavation) before handing it over to the ArchSD.

2.9 In October 1995, after the award of the Contract in the same month, the ArchSD issued a Request for Employer's Change for extending the entire length of the GFS northern site boundary (i.e. by eight metres to the southern edge of the airside road as had been agreed by the AA – see Item (h) of Table 1 in para. 2.5 above). In November 1995, the Contractor submitted the Contractor's Proposal in response to the Request for Employer's Change.

2.10 The sequence of major events in the handover of the extension area by the AA to the ArchSD is given in Table 2 below.

Table 2
Sequence of major events in
the handover of the extension area by AA to ArchSD
(para. 2.10 refers)

	Date	Events
(a)	October 1995	The Contractor commenced the contract works.
(b)	December 1995	The ArchSD requested the AA to hand over the extension area by 31 January 1996. The AA said that the trench in the extension area might not be filled up until late 1996.
(c)	January and February 1996	The ArchSD requested the AA to take urgent action to make available the extension area, as the works in the GFS site were in an advanced stage.
(d)	June 1996	The ArchSD asked the AA to confirm, as a matter of urgency, whether the entire extension area would be made available by 4 November 1996.
(e)	July 1996	The AA advised the ArchSD that the extension area would be made available by 4 November 1996, subject to the progress of the works of the AA's contractor.

	Date	Events
(f)	August 1996	The ArchSD told the AA that there would be contractual implications if the AA did not hand over the extension area by 4 November 1996 or did not accord with the agreed condition (i.e. backfilling of the trench should be completed by the AA's contractor) at the time of the handover. The AA confirmed that the extension area would be handed over.
(g)	October 1996	The ArchSD issued an Instruction of Employer's Change for the revision of the site boundary and increase of the site area.
(h)	October 1996	The ArchSD found that the AA's contractor was still constructing communication ducts and pits in the extension area, which would not be compatible with the proposed layout of the apron drainage and the helipads. The ArchSD asked the AA to remove the communication ducts and pits and to ensure that the extension area would accord with the agreed condition at the time of the handover.
(i)	November 1996	On 4 November 1996, the AA was not able to hand over the extension area because its contractor was still constructing the communication ducts and pits.
(j)	November 1996	The New Airport Projects Coordination Office (NAPCO – Note 1), the AA, the ArchSD, the GFS and the Contractor held a site meeting. At the meeting, the AA agreed to hand over the extension area by 16 December 1996.
(k)	December 1996	The ArchSD informed NAPCO that it had received no reply from the AA regarding the handover of the extension area. The ArchSD requested NAPCO to resolve the matter as soon as possible.
(l)	March 1997	The AA handed over the extension area to the ArchSD. However, the communication ducts and a draw pit of the AA were not compatible with the proposed location of the surface channel at one of the helipads (Note 2). Therefore, the Contractor had to revise the drainage design at the location of this helipad.

Source: ArchSD's records

Note 1: NAPCO was the executive arm of the Airport Development Steering Committee chaired by the Chief Secretary. It was responsible for the overall management of the Airport Core Programme projects. One of its main duties was to give advice and guidance to departments about the resolution of interface problems. NAPCO was disbanded in March 1999, after completion of the Airport Core Programme projects.

Note 2: At the site meeting held in November 1996 (see Item (j) above), the AA agreed that the draw pit, which was located within one of the GFS helipads, would be demolished. However, at the time of handover, the draw pit was still in the extension area. In view of the significant amount of works involved, on the handover date of 17 March 1997, the AA, the GFS and NAPCO agreed that the draw pit should remain at its original location.

Delay in the overall completion of the project

2.11 **As a result of the delay in the handover of the extension area and the need for re-design work, the drainage works in the extension area were delayed.** The ArchSD assessed that the Contractor was entitled to an EOT of 49 days and to the payment of a prolongation cost (see para. 2.1 above).

Audit observations on extension of site boundary

2.12 **In September 1994, a year before the award of the Contract, the GFS informed the ArchSD that it would require two helipads. However, the ArchSD only informed the AA in June 1995 that a revision of the GFS northern site boundary would be necessary to accommodate the two helipads within the GFS site. Audit considers that, upon receiving the advice of the GFS in September 1994 that it required two helipads, the ArchSD should have sought an early agreement from the AA for extending the GFS site boundary and secured a firm handover date of the extension area before the letting of the Contract.**

2.13 **After the commencement of the Contract in October 1995, the ArchSD had made considerable efforts to seek AA's confirmation for the timely handover of the extension area, but the efforts were in vain.** In the event, there was delay in the handover of the extension area. Due to the delay and the presence of the AA's communication ducts and draw pit in the area, the Contractor's works were delayed (see Table 2 in para. 2.10 above). The ArchSD had to grant an EOT and pay a prolongation cost to the Contractor (see para. 2.1 above). **In January 2002, in response to Audit's enquiry, the ArchSD informed Audit that there was no binding agreement between the AA and the Government for the timely handover of the extension area.**

Audit recommendations on extension of site boundary

2.14 **Audit has recommended that the Director of Architectural Services, when negotiating with a third party (e.g. the AA) concerning the handover of a site for a government contract, should:**

- (a) **resolve issues relating to the handover of the site before the letting of the contract so that the site can be made available before the commencement of the works; and**
- (b) **obtain a binding agreement from the third party concerned so that it can be held responsible for reimbursing the Government any prolongation cost arising from its failure to hand over the site on time.**

Response from the Administration

2.15 The **Director of Architectural Services** has said that:

- (a) although the GFS advised the ArchSD, in September 1994, that it would require two helipads, it was not until December 1994 that the AA agreed to the provision of the two helipads, and the ArchSD only received confirmation from the GFS regarding the agreement in February 1995. The ArchSD then took immediate action to amend the tender drawings;
- (b) the ArchSD's contract administration manual already states that the Project Team Leader should, before the contract commencement date:
 - (i) check with the relevant authorities to confirm the site available date as stated in the Project Feasibility Study Report; and
 - (ii) arrange with the Lands Department for setting out the site boundaries/buildings; and
- (c) under normal circumstances, all land matters would be cleared by the Lands Department before the ArchSD would invite tenders for a construction contract. A binding agreement would have been obtained by the Lands Department if a third party outside the Government was involved. In this case, the Lands Department was still negotiating with the AA over the New Airport Land Grant at the time. As the ArchSD had to keep to the overall programme of the new Airport, the ArchSD had to invite tenders as scheduled.

Revision of apron layout

2.16 The apron layout after the extension of the northern site boundary in September 1995 (i.e. before other revisions) is shown in Figure 4(a) in para. 2.17 below. **The GFS subsequently requested revision of the apron layout which was then finalised in August 1996, about a year after the award of the Contract. In late August 1996, the ArchSD issued a Request for Employer's Change for revising the apron layout (Note 8).** The final revised apron layout as approved by the ArchSD on 26 September 1996 (see para. 2.28 below) is shown in Figure 4(b) in para. 2.17 below.

2.17 **The revision of the apron layout also resulted in delay in the design and the construction of the apron area.** The ArchSD assessed that the Contractor was entitled to an EOT of 35 days in respect of the delay (see para. 2.1 above). Audit's review of the revision of the apron layout has revealed that there are lessons to be learnt, as indicated in paragraphs 2.18 to 2.30 below.

Note 8: *At present, the GFS apron area accommodates two helipads, nine helicopter parking bays, three aeroplane parking bays, an apron station, taxilanes, lighting masts and aircraft refuelling facilities.*

Figure 4(a)

**Apron layout after extension of northern site boundary in September 1995
(para. 2.16 refers)**

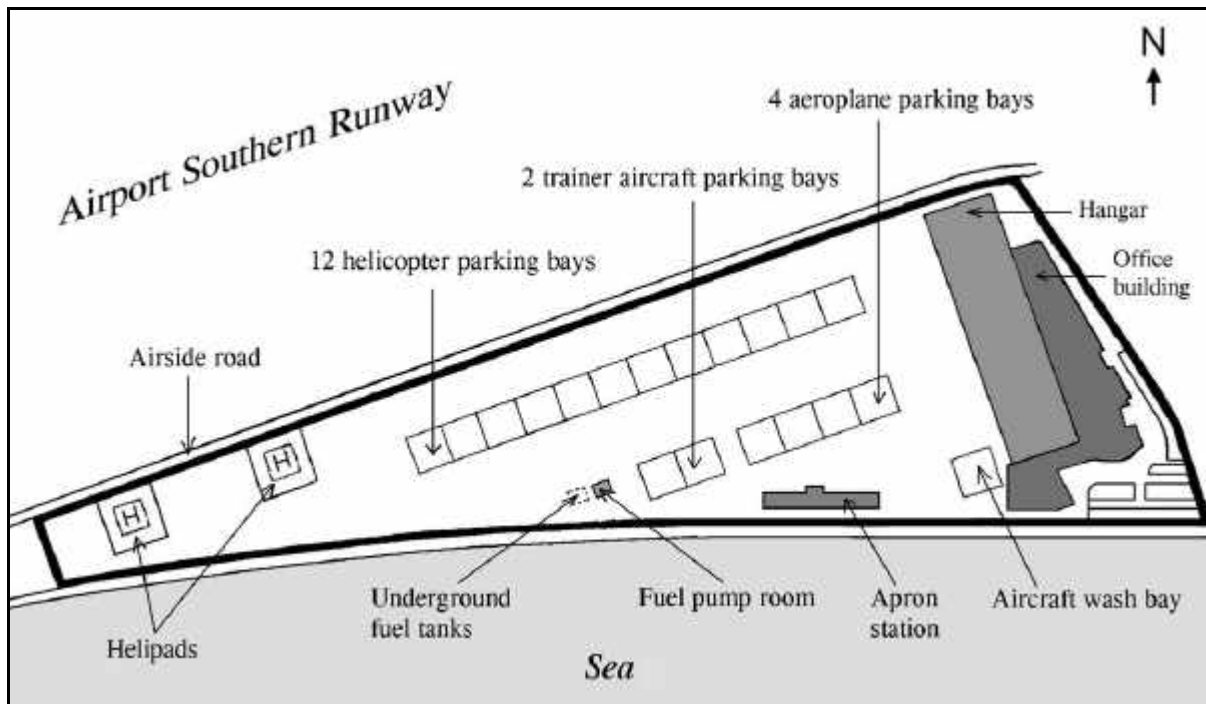
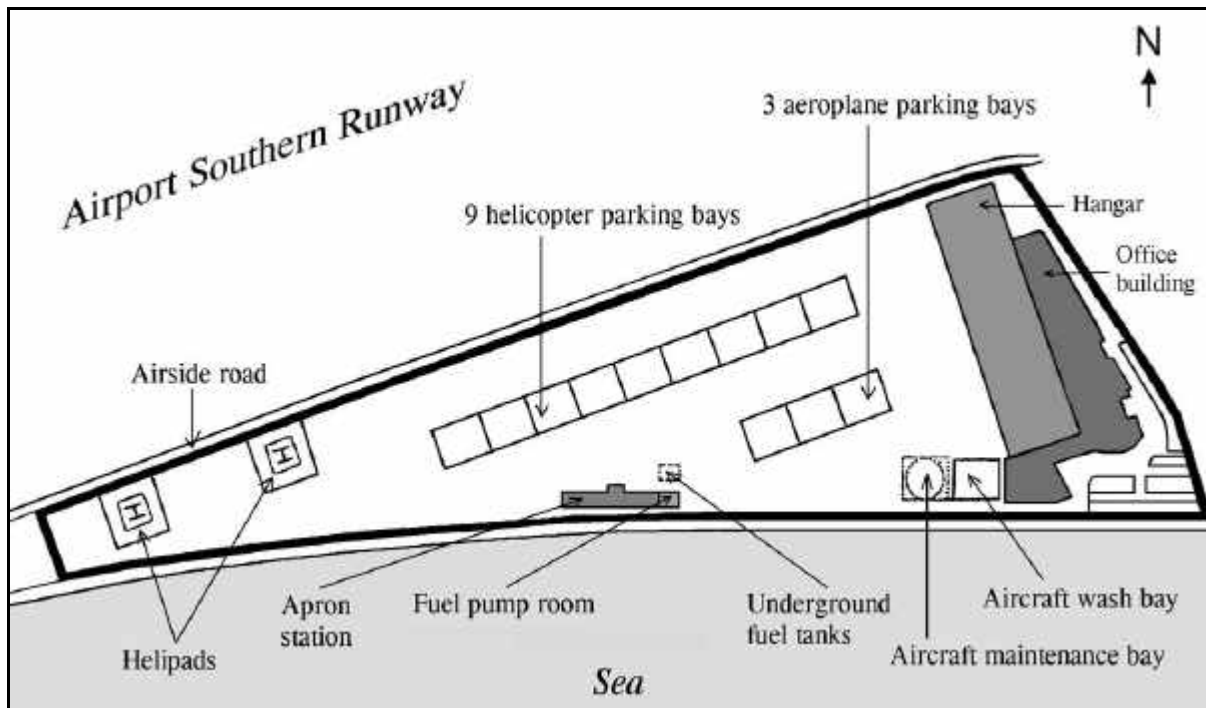


Figure 4(b)

**Final revised apron layout as at September 1996
(para. 2.28 refers)**



Source: ArchSD's records

Revision of apron layout for operational improvements

2.18 As mentioned in paragraph 2.6 above, in late September 1995 (i.e. before the award of the Contract), the AA agreed to the extension of the northern boundary of the GFS site by eight metres. The GFS considered that this extension gave it an opportunity to revise the apron layout to achieve significant operational improvements and have more flexibility in the use of the apron area.

2.19 On 20 December 1995, the GFS forwarded to the ArchSD a drawing showing the revised apron layout (Note 9). The changes included:

- (a) **Parking bays.** The helicopter parking bays were to be shifted northwards by four metres (Note 10);
- (b) **Refuelling system.** The underground fuel tanks and the fuel pump room were to be relocated to the northwestern corner of the hangar building (Note 11); and
- (c) **Apron station.** The apron station was to be relocated to the middle of the apron area.

2.20 In late April 1996, the GFS informed the ArchSD that it was still considering the location of the aircraft refuelling system which included mainly the underground fuel tanks, the fuel pump room and the underground pipework. The GFS said that it would not be able to finalise the apron layout until it had decided on the location of the aircraft refuelling system.

Further revision of apron layout

2.21 In mid-July 1996, the ArchSD asked the GFS to clarify its apron layout requirements so that the ArchSD could give an indicative sketch of the apron area to the Contractor. In response, on 18 July 1996, the GFS specified the following apron layout requirements:

- (a) **Number of parking bays.** Nine helicopter parking bays, three aeroplane parking bays and two aircraft maintenance bays should be provided (instead of the twelve helicopter

Note 9: *The final revised apron layout was approved by the ArchSD in September 1996 (see Figure 4(b) in para. 2.17 above and para. 2.28 below).*

Note 10: *In a later revision of the apron layout, the helicopter parking bays were shifted northwards by eight metres instead of four metres (see para. 2.24(a) below).*

Note 11: *In a later revision of the apron layout, the underground fuel tanks and the fuel pump room were placed back to their original position, i.e. in the middle of the apron area (see para. 2.21 below).*

parking bays, four aeroplane parking bays and two trainer aircraft parking bays as specified in the Contract). The reasons were as follows:

- (i) the number of aircraft parking bays had to be changed because of the need to install lighting masts within the apron area (Note 12);
 - (ii) the two trainer aircraft parking bays would not be necessary because the two trainer aircraft would soon be sold; and
 - (iii) two aircraft parking bays would have to be provided for maintenance purposes (Note 13);
- (b) **Size of helicopter parking bays.** The size of the helicopter parking bays had to be increased to provide adequate distance separation between parked helicopters and the lighting masts, and to provide space for the fuel dispensing units to be located between the aircraft parking bays; and
- (c) **Size of helipads.** The size of the two helipads should be reduced to 24 metres by 24 metres, instead of 35 metres by 35 metres as designed (Note 14).

In its response of 18 July 1996, the GFS did not mention the location of the aircraft refuelling system. Audit noted that, on 12 July 1996, the ArchSD confirmed to the Contractor that the location of the underground fuel tanks and the fuel pump room was to remain unchanged.

2.22 On 29 July 1996, the ArchSD received from the Contractor a revised apron layout which incorporated the latest requirements of the GFS. On 31 July 1996, the ArchSD asked the GFS to confirm whether the revised apron layout, in respect of the following requirements, was acceptable:

- (a) the helicopter parking bays and aeroplane parking bays;

Note 12: *In June 1996, the GFS agreed with the Contractor to allow high mast lighting to be installed at the centre of the apron area and alongside the southern fence. The GFS said that the agreement was given on the condition that the apron layout would be revised at the Contractor's costs and that the height of the lighting masts was not excessive.*

Note 13: *One of the aircraft maintenance bays was subsequently deleted, as its location was affected by the fuel pump room (see para. 2.23(c) below).*

Note 14: *The final size of each of the helipads was 35 metres by 35 metres (see para. 2.27(a) below).*

- (b) the apron station, the underground fuel tank, and the fuel pump room; and
- (c) the two maintenance parking bays.

The ArchSD said that, upon receipt of the confirmation of the GFS, the Contractor would be able to finalise the apron layout.

2.23 In response, on 2 August 1996, the GFS advised the ArchSD that:

- (a) **Parking bays.** The positioning of the aircraft (i.e. both helicopter and aeroplane) parking bays, as mentioned in the GFS memo of 20 December 1995 (see para. 2.19(a) above), should have been adjusted northwards by four metres (Note 15);
- (b) **Apron station and refuelling system.** The setting-out of the apron station, the underground fuel tanks and the fuel pump room was rather difficult until the actual sizes had been determined; and
- (c) **Maintenance parking bays.** The two maintenance parking bays as mentioned in its memo of 18 July 1996 were not shown on the revised apron layout. The western maintenance parking bay might be deleted if its location was affected by the location of the fuel pump room.

2.24 **At a design meeting held on 9 August 1996 to discuss the revised apron layout drawing submitted by the Contractor on 29 July 1996 (see para. 2.22 above), the GFS, the ArchSD and the Contractor agreed that:**

- (a) **Parking bays.** The helicopter parking bays and the aeroplane parking bays should be shifted northwards by eight metres and four metres respectively;
- (b) **Apron station.** The apron station, which had to be relocated to the middle of the apron, should be at a distance of six metres from the southern fence of the GFS site; and

Note 15: *In the GFS memo of 20 December 1995, the GFS only requested the shifting of the helicopter parking bays northwards by four metres. However, on 9 August 1996, the GFS requested the shifting of the helicopter parking bays by eight metres and the aeroplane parking bays by four metres northwards (see para. 2.24(a)).*

- (c) **Refuelling system.** The fuel pump room should be located next to the apron station so that the view of the apron from the apron station would not be blocked. The apron station and the fuel pump room should be positioned in such a way that shifting of the proposed location of the underground fuel tanks would be minimised.

The Contractor was required to submit another revised apron layout drawing for final comment by the GFS.

2.25 On 19 August 1996, the Contractor submitted the revised apron layout. However, the ArchSD rejected it because it did not accurately show the agreed layout.

2.26 **On 22 August 1996, the Contractor resubmitted another revised apron layout drawing which had incorporated the requirements of the GFS given on 9 August 1996 (see para. 2.24 above).** The ArchSD immediately forwarded the revised apron layout drawing to the GFS. The ArchSD said that urgent confirmation from the GFS was needed in order that the Contractor could proceed with the detailed design and the construction works.

Final revision of apron layout

2.27 **Another design meeting was held on 28 August 1996 among the GFS, the ArchSD and the Contractor to discuss the revised apron layout drawing submitted by the Contractor on 22 August 1996.** The GFS commented that:

- (a) **Helipads.** The size of the helipads should be changed from 24 metres by 24 metres to 35 metres by 35 metres and should be as close to the northern boundary as possible. The lighting for the helipads should be installed around their perimeter. The apron markings should be provided in accordance with the GFS marked up drawing which was handed to the Contractor at the meeting; and
- (b) **Parking bays.** The Contractor's proposal to increase the width of the dividing strip between aircraft parking bays was considered acceptable and no shifting of the parking bays was required.

The Contractor was asked to incorporate the requirements of the GFS into the apron layout drawing and to submit the final revised drawing. On 29 August 1996, the ArchSD issued a Request for Employer's Change for revising the apron layout based on the requirements as agreed at the meeting of 28 August 1996.

2.28 **On 12 September 1996, the ArchSD received from the Contractor the final revised apron layout (see Figure 4(b) in para. 2.17 above). On 26 September 1996, the ArchSD approved the final revised apron layout.** The Contractor informed the ArchSD that, in order to minimise the delay in the construction of the apron area, he had started the construction of the underground fuel tanks and part of the drainage works at the apron area, despite the fact that the design had not yet been finalised because of the changes (Note 16).

Delay in the overall completion of the project

2.29 According to the works programme for the apron area and helipads, the commencement date and the completion date should be 7 October 1996 and 24 February 1997 respectively. As a result of the late finalisation of the apron layout, the design and construction works of the apron area were delayed. The ArchSD assessed that there was a delay of 45 days. However, the ArchSD considered that the Contractor was not entitled to an EOT of 10 days within the assessed period as the Contractor did not produce accurately a layout drawing in accordance with the required changes (see para. 2.25 above). The ArchSD considered that the Contractor was entitled to an EOT of 35 days and to the payment of a prolongation cost.

Audit observations on revision of apron layout

2.30 **As early as September 1995, immediately before the award of the Contract, the GFS had been considering the revision of the apron layout (see para. 2.18 above). However, it was only after the design meetings held in August 1996 (i.e. eleven months after September 1995) that the GFS finalised its apron layout requirements (see paras. 2.24 and 2.27 above).** Because of the late finalisation of the apron layout, the ArchSD had to grant an EOT and pay a prolongation cost to the Contractor (see para. 2.1 above). **In order to avoid delay and the payment of a prolongation cost due to the late changes in requirements, Audit considers that the ArchSD should have required the GFS to finalise its apron layout requirements before an agreed cut-off date.**

Audit recommendations on revision of apron layout

2.31 **Audit has recommended that, in implementing a design-and-build contract, the Director of Architectural Services should:**

- (a) **require the user department to finalise its design requirements before an agreed cut-off date so as to ensure that the contractor is provided with sufficient time to complete the final design work; and**

Note 16: *In March 1997, the ArchSD instructed the Contractor to proceed with the works in accordance with the final revised apron layout at an agreed cost of \$4.2 million.*

(b) **if the user department requires changes to the design requirements after the agreed cut-off date, which may have time and cost implications:**

(i) **critically assess the user department's need for such changes; and**

(ii) **if necessary, require the user department to seek the approval of the relevant policy bureau.**

2.32 **Audit has recommended that, as the user, the Controller, Government Flying Service should finalise the design requirements before the agreed cut-off date set by the works department, so as to avoid delay and claims for prolongation cost by the contractor, especially if the works are to be carried out by a design-and-build contract.**

Response from the Administration

2.33 The **Director of Architectural Services** has said that:

- (a) he generally agrees with the audit recommendations as mentioned in paragraph 2.31 above; and
- (b) the ArchSD's contract administration manual states that the scope of variation works must be confined to changes which are absolutely essential for the completion of the Contract and not as a result of a "change of mind". In this case, the changes to the apron layout as requested by the GFS were due to operational and technical reasons and were absolutely essential. If they had not been carried out, the operation of the GFS would have been affected. It was unfortunate that the changes were requested at a late stage, causing delays and resulting in the prolongation cost. However, if the changes were to be carried out after the GFS Headquarters had been put into operation, it would have been disruptive and more costly.

2.34 The **Controller, Government Flying Service** has said that:

- (a) he agrees that a cut-off date should be set and the user department should finalise the design requirements by that date so as to avoid delay and claims for prolongation cost by the contractor; and
- (b) if a cut-off date had been set and if the GFS had been informed of it, the GFS would surely have abided by it.

PART 3: PROVISION OF ADDITIONAL TANKER REFUELLING STATION AND PIPEWORK

3.1 This PART examines the provision of an additional tanker refuelling station and additional pipework for the aircraft refuelling system at the GFS Headquarters. The additional facilities have not been used since their completion in mid-1998. The audit has revealed that there are lessons to be learnt.

The aircraft refuelling system

3.2 According to the provision of the Contract, the aircraft refuelling system at the GFS Headquarters mainly included:

- (a) an underground fuel tank chamber with three underground fuel tanks;
- (b) a tanker refuelling station for unloading aviation fuel from supply tankers into the underground tanks;
- (c) a fuel pump room; and
- (d) a set of distribution pipework which interconnected the items mentioned in (a), (b) and (c) above.

The underground fuel tank chamber, the tanker refuelling station and the fuel pump room were to be located in the middle of the apron area and near the GFS southern site boundary.

Additional tanker refuelling station and pipework

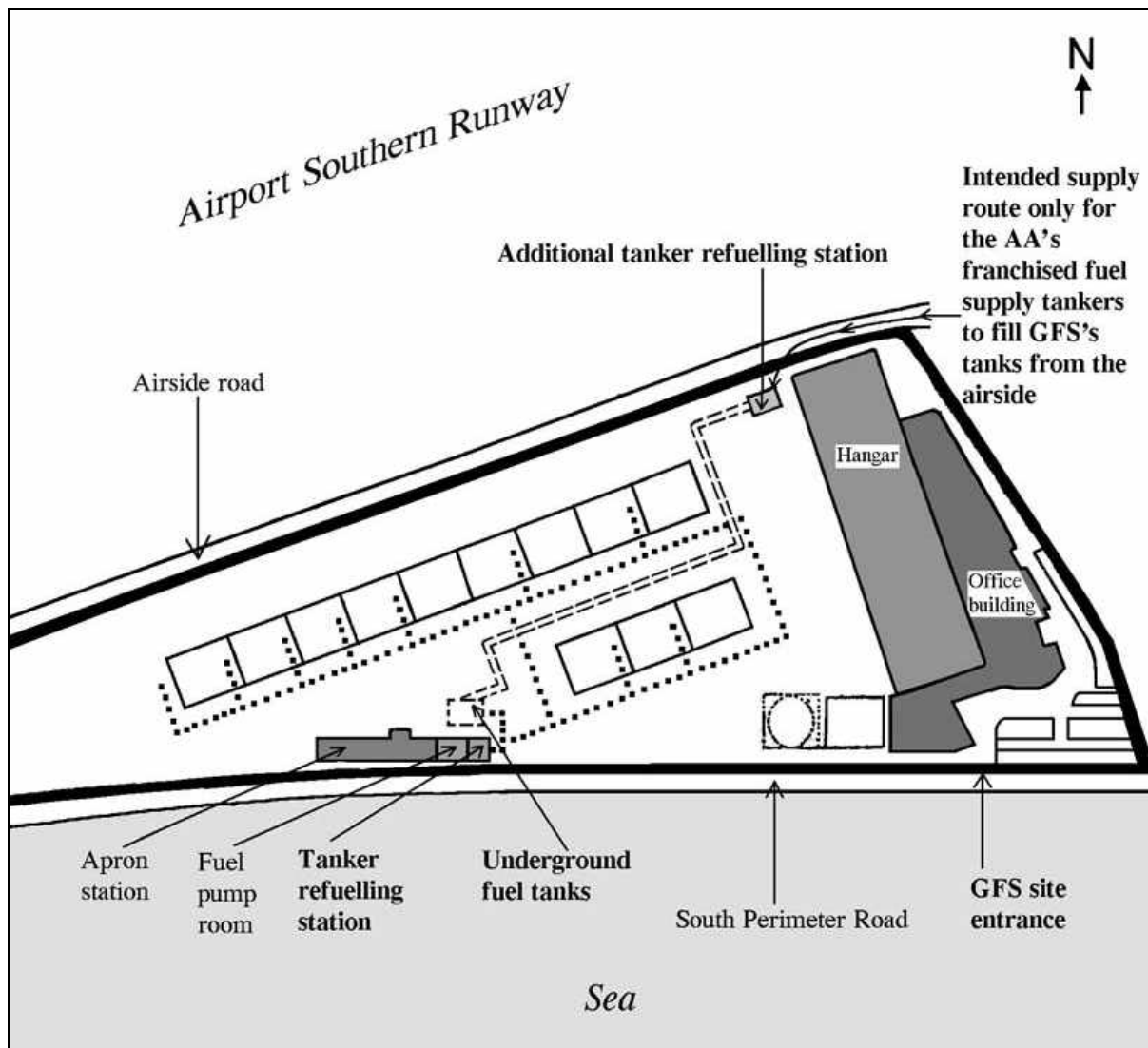
3.3 At the request of the GFS, in October 1996, a year after the award of the Contract, the ArchSD issued to the Contractor a Request for Employer's Change for constructing:

- (a) another tanker refuelling station at the northwestern corner of the hangar building, in addition to the tanker refuelling station in the middle of the apron area (see para. 3.2(b) above); and
- (b) another set of pipework, in addition to the distribution pipework (see para. 3.2(d) above), to link up the additional tanker refuelling station with the underground fuel tanks.

The intention of the GFS was that the additional tanker refuelling station and pipework would enable the supply tankers of the AA's franchised fuel supplier to fill the GFS underground fuel

tanks from the airside (Note 17) without entering the GFS active apron area. The AA would not allow tankers of other suppliers to supply fuel to the GFS from the airside. A map showing the location of the tanker refuelling stations and pipework is at Figure 5 below.

Figure 5
Location of tanker refuelling stations and pipework
(paras. 3.3 and 3.6 refer)



Legend: - - - - - Distribution pipework

 = = = = = Additional pipework

Source: ArchSD's records

Note 17: *The airside means that part of the airport area to which access is restricted to authorised persons or vehicles in accordance with the Aviation Security Ordinance (Cap. 494) and its subsidiary regulations.*

Arrangements for fuel supply tankers to access the GFS site

3.4 At a meeting held in May 1995 (i.e. before the award of the Contract), the AA informed the ArchSD and the GFS that, from the airport security point of view, it was preferable that the supply tankers should enter the GFS site from the airside, instead of from the South Perimeter Road. The ArchSD and the GFS said that they would review the GFS site layout for such an access arrangement.

3.5 In early July 1996, in finalising the project design, the ArchSD asked the AA whether it would consider allowing the supply tankers to access the GFS site from the South Perimeter Road (Note 18). **In response, the AA said that the primary concern was airport security. Accordingly, the supply tankers should preferably enter the GFS site from the airside.**

Request for additional tanker refuelling station

3.6 In mid-August 1996, the AA assured the ArchSD that it would facilitate the AA's franchised supply tankers to access the GFS site from the airside. However, the AA said that it would take a little while to resolve the matter and it would inform the ArchSD of the progress, probably at the end of 1996. In late August 1996, the GFS wrote to the ArchSD to request an additional tanker refuelling station to be located at the northwestern corner of the hangar. **This would enable the AA's franchised supply tankers to fill the GFS underground fuel tanks from the airside without entering the GFS active apron area (see Figure 5 in para. 3.3 above), once the AA established a franchised arrangement for the regular supply of aviation fuel to the airlines, including the GFS.**

3.7 Upon Audit's enquiry, in January 2002, the GFS informed Audit that, in addition to the main reason mentioned in paragraph 3.6 above, there was another reason for requesting, in August 1996, the construction of the additional facilities. According to the GFS, the other reason was that, if its aviation fuel was eventually supplied by a supplier whose supply tankers had to reach the GFS Headquarters via the Tsing Ma Bridge (Note 19), then, if the Tsing Ma Bridge was blocked (Note 20), the additional facilities could function as back-up facilities to enable the GFS to

Note 18: *The GFS preferred this supply route because of the proximity of the GFS site entrance to the tanker refuelling station which was located in the middle of the apron area near the southern site boundary (see Figure 5 in para. 3.3 above).*

Note 19: *Since the relocation of the GFS Headquarters to the new Airport, the GFS has been receiving aviation fuel, under a Government Supplies Department's bulk contract, from supply tankers which reach the GFS Headquarters via the Tsing Ma Bridge (see para. 3.12 below).*

Note 20: *The blockage of the Tsing Ma Bridge will not affect the AA's franchised fuel supplier because its fuel depot is on the airport island and is replenished via submarine pipelines.*

receive an alternative supply of aviation fuel from the AA's franchised supplier (Note 21). The GFS considered that:

- (a) it could not rule out the possibility that access of supply tankers to the GFS Headquarters via the Tsing Ma Bridge might be denied at short notice, as a result of, say, an explosion of a dangerous goods vehicle on the Tsing Ma Bridge; and
- (b) it had to ensure that an alternative source of supply of aviation fuel was available to the GFS in emergency situations, as the GFS underground fuel tanks could only store up to 30 days of fuel for normal usage.

3.8 In mid-October 1996, the ArchSD issued a Request for Employer's Change to design and build the additional tanker refuelling station and pipework. **On 26 March 1997, the ArchSD instructed the Contractor to implement the Employer's Change.**

Supply of aviation fuel

3.9 Audit noted that, at the old Kai Tak Airport, the fuel supply to the GFS Headquarters was arranged under a Government Supplies Department's bulk contract. The GFS obtained aviation fuel from supply tankers which reached its Headquarters from a public road through the main entrance (Note 22).

3.10 In mid-August 1997, the Government Supplies Department (GSD) informed the GFS that the fuel supply bulk contract would expire on 31 May 1998 and requested the GFS to specify its requirement for a new 24-month contract commencing 1 June 1998. In early April 1998, the GFS informed the GSD that it was seeking clarification from the AA whether the franchised arrangement established by the AA in March 1997 for the supply of aviation fuel would also cover the fuel requirements of the GFS. The GFS said that it would withhold acceptance of the offer from the GSD's prospective fuel supplier, pending further advice from the AA.

Note 21: *Audit considers that, even in emergency situations, the additional facilities are not absolutely necessary because the AA's franchised fuel supply tankers can reach the tanker refuelling station in the middle of the apron area either from the airside or via the South Perimeter Road.*

Note 22: *No supply tankers other than the franchised supply tankers would be permitted to operate in the airside area (see para. 3.3 above). Therefore, the supply tankers of the Government Supplies Department's fuel supplier must enter the GFS site from a public road.*

3.11 **In late April 1998, the GFS informed the GSD that the AA's franchised arrangement for the supply of aviation fuel would not cover the GFS.** The GSD subsequently renewed the bulk contract which covered the supply of aviation fuel for the GFS.

3.12 Since the relocation of the GFS to the new Airport, the GFS has been receiving aviation fuel, under the GSD's bulk contract, from supply tankers which reach the GFS Headquarters via the Tsing Ma Bridge, and through its site entrance on the South Perimeter Road. **The supply tankers only use the tanker refuelling station in the middle of the apron area to unload fuel into the underground tanks.**

3.13 **In response to Audit's enquiry, in January 2002, the GFS confirmed that the additional tanker refuelling station and pipework had not yet been used since their completion. The GFS said that the present arrangement for fuel supply under the GSD's bulk contract was very satisfactory and, so far, there were no emergency situations which necessitated the use of the additional facilities.** The GFS also said that:

- (a) in September 2001, it initiated discussions with the GSD's fuel supplier for the supply of aviation fuel to the GFS through the AA's franchised fuel supplier in emergency situations;
- (b) according to the GSD's fuel supplier, there were insurance and indemnity issues to be considered if a fuel supply arrangement was to be established with the AA's franchised fuel supplier; and
- (c) it would continue to pursue with the relevant authorities with a view to putting in place an alternative supply of fuel to cover emergency situations.

Audit observations on provision of additional tanker refuelling station and pipework

3.14 The additional tanker refuelling station and pipework were constructed at a cost of \$3.9 million. The GFS's main reason for the construction of the additional facilities was that it would enable the AA's franchised supply tankers to supply fuel to the GFS underground fuel tanks from the airside without entering the GFS active apron area (see para. 3.6 above). **However, Audit notes that the AA's franchised arrangement for the regular supply of aviation fuel does not cover the GFS (see para. 3.11 above). Audit considers that the GFS should have made a firm arrangement with the AA for the supply of aviation fuel before instructing the Contractor to construct the additional tanker refuelling station and pipework in March 1997.**

3.15 **Audit also notes that, so far, no alternative fuel supply arrangement has been made for the supply of aviation fuel to the GFS in emergency situations. Audit considers that the GFS should expedite action to acquire an alternative supply of aviation fuel for the GFS (e.g. from the AA's franchised fuel supplier) in emergency situations.**

**Audit recommendations on provision of
additional tanker refuelling station and pipework**

3.16 **Audit has *recommended* that the Controller, Government Flying Service should:**

- (a) **before requesting the provision of any additional facilities with significant cost implications (such as the additional tanker refuelling station and pipework), ensure that necessary arrangements are made with the third parties concerned (such as the AA) to enable the GFS to use the facilities as intended; and**
- (b) **expedite action to acquire an alternative supply of aviation fuel for the GFS (e.g. from the AA's franchised fuel supplier) in emergency situations.**

Response from the Administration

3.17 The **Controller, Government Flying Service** agrees with the audit recommendations as mentioned in paragraph 3.16 above.

PART 4: REVISIONS OF ROOM LAYOUT AND RELATED BUILDING SERVICES PROVISIONS

4.1 This PART examines the delays caused by late and substantial changes to the room layout and the related building services provisions on the first floor of the GFS Headquarters office building. Because of the substantial changes, the ArchSD had to grant an EOT of 56 days and pay a prolongation cost of \$3.9 million to the Contractor. The completion date of the Contract was thereby extended to 16 November 1997. The audit has revealed that there are lessons to be learnt in contract administration.

Submission and approval of design building plans

4.2 The Contract specified a two-stage submission and approval of design information, namely a preliminary design stage and a final design stage (Note 23). The sequence of major events in the submission and the approval of the design building plans of the GFS Headquarters is given in Table 3 below.

Note 23: *The Contractor was required to obtain the ArchSD's approval of the preliminary design submission, which should have addressed all users' requirements, before making the final design submission.*

Table 3
Sequence of major events in submission and
approval of design building plans of the GFS Headquarters
(para. 4.2 refers)

	Date	Events
(a)	12 June 1996	The Contractor submitted preliminary design building plans to the ArchSD for approval, after incorporating the comments from the ArchSD, the GFS and the Hong Kong Police Force (HKPF).
(b)	14 June 1996	The Contractor submitted a supplementary set of revised building plans to the ArchSD for additional comments from the user departments.
(c)	4 July 1996	The ArchSD informed the Contractor about the comments of the user departments on the revised design building plans.
(d)	25 July 1996	The ArchSD gave its Notice of No Objection to the set of preliminary design building plans submitted by the Contractor on 12 June 1996.
(e)	September 1996	The Contractor submitted a series of final design building plans to the ArchSD for approval.
(f)	3 October 1996	The ArchSD gave its Notice of No Objection to the complete set of final design building plans submitted by the Contractor.

Source: ArchSD's records

Substantial changes to the final design building plans

4.3 As shown in Table 3 above, the ArchSD approved the final design building plans on 3 October 1996. However, substantial changes to the approved final design building plans were required to incorporate:

- (a) late changes requested by the HKPF (see para. 4.6 below); and
- (b) late changes requested by the GFS (see para. 4.12 below).

4.4 The room layout of the first floor according to the final design building plans approved by the ArchSD on 3 October 1996, and the rooms requiring changes as requested by the HKPF and the GFS, are shown in Appendix A. In late April 1997, the Contractor completed the revision of the final design building plans. **On 6 May 1997, the ArchSD gave its Notice of No Objection to the revised final design building plans.**

4.5 The substantial changes had delayed the Contractor's works and the installation of the Mechanical Ventilation and Air-conditioning System. As a result, the ArchSD had to grant an EOT and pay a prolongation cost to the Contractor (see para. 4.1 above).

Revisions of room layout and related building services provisions of HKPF accommodation

4.6 The HKPF is provided with small-scale accommodation within the GFS Headquarters, including offices and workshops, for its operations. **On 23 June 1996, the ArchSD asked the HKPF to comment on the revised building plans of the HKPF accommodation. The ArchSD informed the HKPF that to meet the target of the contract programme, the HKPF's reply was urgently required by the Contractor.** On 3 July 1996, the HKPF commented on the revised building plans and marked on the drawings its preferred locations of power outlets and telephone points in the relevant rooms. On 4 July 1996, the ArchSD asked the Contractor to ensure compliance with the HKPF's requirements. **Thereafter in late August, September and December 1996, the HKPF requested changes to the room layout and the related building services provisions.** The sequence of major events in changing the room layout and the related building services provisions is given in Table 4 below.

Table 4

**Sequence of major events in requesting changes
to room layout and building services provisions of HKPF accommodation
(para. 4.6 refers)**

Date	Events
<i>Request for changes in August 1996</i>	
(a) 28 August 1996	<p>The HKPF informed the ArchSD and the Contractor that its comments of 3 July 1996 (see para. 4.6 above) were to be superseded. The HKPF requested the Contractor to provide, in accordance with the HKPF drawings supplied to the Contractor, power outlets and cable tray for the HKPF Private Automatic Branch Exchange (PABX) and Line Termination (LT) Room, Security Room and Metal Workshop.</p> <p>The HKPF also requested the Contractor to provide power outlets and telephone points required by the Office of the Telecommunications Authority (OFTA – Note) in the PABX and LT Room.</p>
(b) 29 August 1996	<p>The ArchSD issued a Request for Employer’s Change to cover the HKPF’s requests mentioned above. (This Request was superseded on 20 September 1996 – see Item (f) below.)</p>
<i>Request for changes in September 1996</i>	
(c) 5 September 1996	<p>The HKPF informed the ArchSD that, during the discussions with the OFTA, it had emerged that there was not enough space in the PABX and LT Room to accommodate the PABX system and the HKPF communication equipment.</p>
(d) 12 September 1996	<p>The HKPF informed the ArchSD that it proposed to utilise some space in the General Office to form a new LT Room to accommodate its equipment. This would necessitate the relocation of the four partitioned offices in the General Office.</p>
(e) 19 September 1996	<p>The HKPF forwarded to the ArchSD its amended drawings, taking into account the provision of the new LT Room, with details about the revised power outlets, trunking and telephone point requirements.</p>

Date	Events
(f) 20 September 1996	The ArchSD issued a Request for Employer's Change to cover the HKPF's request for the new LT Room in the General Office and the relocation of the four partitioned offices, as well as the related changes in building services provisions. (This Request was superseded on 20 December 1996 – see Item (i) below.)

Request for changes in December 1996

(g) 7 December 1996	The HKPF (after making a site visit to the General Office) informed the ArchSD that it would not be practical to place the four partitioned offices in the General Office in the locations as previously requested. The HKPF asked the ArchSD to reduce the number of partitioned offices in the General Office from four to two, and to relocate them in accordance with the revised drawing.
(h) 17 December 1996	The HKPF forwarded to the ArchSD the drawing showing details of the revised power outlets, cable duct and conduit, and telephone point requirements, which were amended in accordance with the revised location of the offices.
(i) 20 December 1996	The ArchSD issued a Request for Employer's Change to cover the changes requested by the HKPF in August, September and December 1996.

Source: ArchSD's records

Note: The OFTA is the authority responsible for setting the requirements and standards for PABX rooms in government buildings.

**Provision of demountable partitions
for some HKPF workshops**

4.7 In October 1994 (i.e. a year before the award of the Contract), the HKPF informed the ArchSD that the preferred wall construction methods for the HKPF workshops should be brickwork, blockwork or reinforced concrete, and that for the offices should be demountable partitions.

4.8 ***The partitioning wall system as specified in the Contract.*** The HKPF's requirement for the partitioning wall system, as mentioned in paragraph 4.7 above, was specified in the Employer's Requirements for the Contract. The Employer's Requirements stated that:

- (a) reinforced concrete, brickwork or blockwork should be adopted for the workshops and equipment rooms, the general office, the lecture and briefing room, the security room, the PABX and LT Room, the toilet and changing rooms, the dark room and pantry; and
- (b) demountable dry wall construction or self-finished propriety partition should be adopted for other office areas.

4.9 ***HKPF's request for provision of demountable partitions for some of the workshops.*** On 4 October 1995, immediately after the award of the Contract, the HKPF informed the ArchSD that demountable partitions, instead of brickwork, blockwork or reinforced concrete, should be used as the partitioning walls between three workshops. The HKPF asked the ArchSD to arrange for such a change.

4.10 ***HKPF's request not implemented.*** In early December 1996, after a site visit to the HKPF accommodation, the HKPF noted that the partitioning walls for the three workshops were constructed of brickwork instead of demountable partitions. The HKPF informed the ArchSD that its request had not been implemented.

4.11 ***HKPF's request considered as essential and subsequently implemented.*** In late January 1997, the HKPF informed the ArchSD that, after careful consideration, the HKPF still considered that the provision of demountable partitions between the three workshops was essential. **On 14 February 1997, the ArchSD issued a Request for Employer's Change to provide the demountable partitions for the workshops.** The ArchSD told the Contractor that as the demountable partitions might be removed in future, all power outlets and telephone points on the partitioning walls should be relocated to the nearest sidewalls and be terminated above the suspended ceiling level.

Revisions of room layout and related building services provisions of GFS accommodation

4.12 After consultation with the user departments, in October 1996, the ArchSD gave its Notice of No Objection to the complete set of final design building plans submitted by the Contractor (see Item (f) of Table 3 in para. 4.2 above). **Thereafter, between November 1996 and February 1997, the GFS requested substantial changes to the room layout and the related building services provisions of the GFS accommodation.** The sequence of major events in changing the room layout and the related building services provisions of the GFS accommodation is given in Table 5 below.

Table 5
Sequence of major events in requesting changes
to room layout and building services provisions of GFS accommodation
(para. 4.12 refers)

Date	Events
<i>Request for changes in November 1996</i>	
(a) 29 November 1996	The GFS informed the ArchSD that, due to organisational restructuring, the GFS would create a separate Quality Assurance Section from its Engineering Section (Note). There was a need to change the room layout of its engineering staff accommodation on the first floor. The GFS forwarded to the ArchSD a draft sketch indicating the proposed changes.
(b) 16 December 1996	The ArchSD returned the sketch to the GFS with suggested revisions.
(c) 24 December 1996	The GFS forwarded to the ArchSD a sketch showing its revised requirements. On the same day, the ArchSD issued a Request for Employer's Change to cover the revised requirements of the GFS. The room layout of the GFS engineering staff accommodation according to the final design building plans approved by the ArchSD in October 1996, and the revised room layout according to the requested changes, are shown in Appendix B.
<i>Request for changes in January 1997</i>	
(d) 3 January 1997	The GFS asked the ArchSD to make other modifications, mainly in the GFS flying staff accommodation, including i) enlargement of the Air Crewman Officer (Operations) Room, and (ii) relocation of the Tasking Centre and the Flight Planning Centre right next to the Air Command and Control Centre so as to enhance communications between these rooms.
(e) 13 January 1997	The ArchSD issued a Request for Employer's Change to cover the GFS's request mentioned in Item (d) above.
<i>Request for changes in mid-February 1997</i>	
(f) 19 February 1997	The GFS, referring to the creation of the Quality Assurance Section, again requested the ArchSD to make other modifications to its engineering staff accommodation, including alterations to the layout of a number of rooms.
<i>Request for changes in late February 1997</i>	
(g) 27 February 1997	The GFS informed the ArchSD that there would be a need for combining the rooms for the Air Crewman Officer and the Senior Air Crewman Officer so that the officers could communicate directly instead of having to use the telephone or having to walk in and out of the rooms. On the same day, the ArchSD issued a Request for Employer's Change to cover these changes and those mentioned in Item (f) above.

Source: ArchSD's records

Note: The creation of a Quality Assurance Section was first proposed at a GFS Section Heads' meeting on 23 October 1996.

Audit observations on revisions of room layout and related building services provisions

4.13 The completion of the project was delayed due to the substantial changes to the room layout and the related building services provisions required by the HKPF and the GFS. As a result, the ArchSD had to grant an EOT of 56 days and pay a prolongation cost of \$3.9 million to the Contractor (see para. 4.1 above).

Revisions of room layout and related building services provisions of HKPF accommodation

4.14 Audit noted that, in late September 1996, the ArchSD issued a Request for Employer's Change to cover the HKPF's request for a new LT Room to accommodate the HKPF communication equipment, which was originally planned to be housed in the PABX and LT Room (see Item (f) of Table 4 in para. 4.6 above). Audit considers that the ArchSD, in consultation with the HKPF and the OFTA, should have ascertained and agreed the space requirement of the PABX and LT Room, taking into account the size of the equipment, at an early date so as to avoid subsequent changes.

4.15 To accommodate the new LT Room, four partitioned offices in the General Office had to be relocated to another area (see Item (d) of Table 4 in para. 4.6 above). Audit considers that, when considering setting aside some areas in the General Office for the new LT Room, the HKPF should have ascertained concurrently whether the same number of partitioned offices could still be accommodated in the reduced area of the General Office. This would have obviated the need for making the subsequent revision in December 1996.

4.16 **Audit considers that:**

- (a) **the HKPF, having been advised by the ArchSD in late June 1996 of the tight contract programme (see para. 4.6 above), should have fully considered and finalised its design requirements at an early stage. This would have avoided making subsequent and intermittent requests for changes in August, September and December 1996 (see para. 4.6 above) which would invariably affect the progress of the Contractor's design work; and**
- (b) **the ArchSD should have agreed with the HKPF a cut-off date (Note 24) for finalising the HKPF's design requirements, so as to ensure that the Contractor would be provided with sufficient time to complete the final design building plans.**

Note 24: *According to the ArchSD, the Notice of No Objection given to the design building plans submitted by the Contractor was, in effect, the cut-off date for user departments to finalise their design requirements. However, in response to Audit's enquiry, the HKPF and the GFS said that they were not aware that a cut-off date had been set.*

Provision of demountable partitions for some HKPF workshops

4.17 In October 1995, shortly after the award of the Contract, the HKPF requested the ArchSD to arrange for the provision of demountable partitions for some of its workshops, instead of constructing them of brickwork as specified in the Contract (see para. 4.9 above). However, it was only in mid-February 1997 that the ArchSD issued a Request for Employer's Change for providing the demountable partitions between the workshops (see para. 4.11 above). **Audit considers that the ArchSD should have promptly instructed the Contractor to provide the demountable partitions after the HKPF made its requests in October 1995.**

Revisions of room layout and related building services provisions of GFS accommodation

4.18 Prior to the approval of the preliminary design building plans on 25 July 1996 (see Item (d) of Table 3 in para. 4.2 above), the ArchSD advised the GFS on 18 July 1996 that, due to the tight contract programme, it had to freeze the design and obtain the complete comments of the GFS so that the Contractor could proceed with the detailed design. **However, after the ArchSD's approval of the final design building plans in October 1996 (see Item (f) of Table 3 in para. 4.2 above), the GFS requested changes to the room layout and the related building services provisions of the GFS accommodation.**

4.19 In late November 1996, the GFS said that it would create a separate Quality Assurance Section from its Engineering Section. As a result, late changes to the room layout had to be made to accommodate this Section. **However, Audit noted that the changes requested by the GFS in November 1996 were quite substantial (see Appendix B). In addition, the GFS also requested other changes to the room layout and the related building services provisions in January, mid-February and late February 1997 (see Items (d) to (g) of Table 5 in para. 4.12 above).**

4.20 As the ArchSD had already advised the GFS of the tight contract programme in July 1996, Audit considers that:

- (a) **the GFS should have critically assessed whether it was absolutely necessary to request the changes mentioned in paragraph 4.19 above, and should have avoided making subsequent and intermittent changes to the design; and**
- (b) **the ArchSD should have agreed with the GFS a cut-off date (see Note 24 to para. 4.16(b) above) for finalising the design requirements of the GFS, so as to ensure that the Contractor would be provided with sufficient time to complete the final design building plans.**

Audit recommendations on revisions of room layout and related building services provisions

4.21 **Audit has made *recommendations*, similar to those:**

- (a) **in paragraph 2.31 above, to the Director of Architectural Services; and**
- (b) **in paragraph 2.32 above, to the Controller, Government Flying Service and the Commissioner of Police.**

4.22 **Audit has also *recommended* that, to minimise the risk of claims from a contractor, the Director of Architectural Services should ensure that ArchSD staff promptly instruct the contractor to implement a user department's request for changes.**

Response from the Administration

4.23 The **Director of Architectural Services** generally agrees with the audit recommendations as mentioned in paragraphs 4.21(a) and 4.22 above. Regarding the audit recommendation in paragraph 4.21(a) above, he has made comments similar to those in paragraph 2.33(b) above.

4.24 The **Controller, Government Flying Service** accepts the audit recommendation as mentioned in paragraph 4.21(b) above that the user department should finalise the design requirements before a cut-off date set by the works department so as to avoid delay and claims for prolongation cost by the contractor.

4.25 The **Commissioner of Police** has said that:

- (a) the requirements forwarded to the ArchSD were based on the best of the HKPF's knowledge at the time of submission. However, because of the HKPF's operational requirements, inevitably, there would be circumstances leading to subsequent alterations due to the availability of new information that could not have been foreseen. In those circumstances, the HKPF felt obligated to inform the ArchSD immediately for necessary action. In this way, the HKPF was working conscientiously and aiming to ensure that the design of the office could meet their current needs; and
- (b) if a cut-off date had been set beyond which there would be time and cost implications for subsequent alterations, and if the HKPF had been advised of the cut-off date and the consequences for the proposed alterations, the HKPF would certainly have abided by it and would have taken the implications into consideration in submitting its requirements.

PART 5: OTHER LATE CHANGES AND ADDITIONAL WORKS

5.1 This PART examines the delays caused by a series of late changes and additional works which were carried out by the Contractor **after the extended contract completion date of 16 November 1997** (see para. 4.1 above). The late changes and additional works involved mainly building services works and builder's works. As a result, the ArchSD had to grant the Contractor an EOT of 74 days for the period 10 April 1998 to 22 June 1998 (Note 25), and to pay a prolongation cost of \$5.1 million to the Contractor. Audit's review revealed that there are lessons to be learnt in contract administration and project implementation.

Other late changes requested after the extended contract completion date

5.2 Before and especially after the extended contract completion date of 16 November 1997, the HKPF, the GFS, and the Information Technology Services Department (ITSD – Note 26) requested changes, involving mainly building services works and builder's works, as follows:

- (a) changes in the HKPF PABX Room and the workshops (see paras. 5.3 and 5.4 below);
- (b) changes in the GFS Radio Equipment Room and for the antenna poles on the roof top of the office building (see paras. 5.5 and 5.6 below); and
- (c) changes in the GFS Main Frame Computer Room (see paras. 5.7 and 5.8 below).

On 7 April 1998, the ArchSD issued to the Contractor a formal Instruction for Employer's Change for implementing the changes.

Note 25: *Due to the lack of seawater for testing and commissioning of the air-conditioning system, the ArchSD also granted to the Contractor an EOT of 144 days, for the period 17 November 1997 to 9 April 1998. However, pursuant to the General Conditions of Contract, the Contractor was not entitled to financial claims for the EOT granted (see also Note 6 to para. 1.6 above).*

Note 26: *The ITSD was responsible for installing a Local Area Network in the GFS Headquarters.*

Late request for changes in PABX Room and workshops by HKPF

5.3 ***HKPF's request for changes.*** During the period November 1997 to January 1998, the HKPF requested a number of changes to the building services works and builder's works in the HKPF PABX Room and the workshops to suit the system supplier's requirements.

5.4 ***ArchSD's instruction for changes.*** In response to the HKPF's request for changes, on 7 April 1998, the ArchSD issued to the Contractor an Instruction for Employer's Change. The Contractor completed the changes in May 1998.

Late request for changes in GFS Radio Equipment Room

5.5 ***GFS's request for changes.*** In March 1997, the GSD awarded a contract to a radio equipment supplier for the supply and installation of a radio communication system in the new GFS Headquarters. In mid-November 1997, during a site visit by the GFS and the radio equipment supplier, the GFS verbally informed the Contractor that changes to the building services works and builder's works in the Radio Equipment Room and for the antenna poles on the rooftop were required to suit the supplier's requirements. In late November 1997, the GFS wrote to the ArchSD confirming the changes.

5.6 ***ArchSD's instruction for changes.*** In response to the GFS's request for changes, on 7 April 1998, the ArchSD issued to the Contractor an Instruction for Employer's Change. The Contractor completed the changes in May 1998.

Late request for changes in GFS Main Frame Computer Room

5.7 ***GFS's request for changes.*** The ITSD was responsible for installing a Local Area Network in the new GFS Headquarters. The two servers for the Local Area Network were accommodated in the Main Frame Computer Room of the office building. On 19 September 1997, the ITSD, at a meeting with the GFS, the ArchSD, and the Contractor, asked the GFS to request a number of changes to the building services works and builder's works in the Main Frame Computer Room.

5.8 ***ArchSD's instruction for changes.*** In response to the GFS's request for changes, on 7 April 1998, the ArchSD issued to the Contractor an Instruction for Employer's Change. The Contractor substantially completed the changes in late June 1998.

Further additional works requested after the extended contract completion date

5.9 ***GFS's request for additional works.*** The Contractor was required to carry out fitting-out works in some of the areas of the GFS Headquarters, including the Flight Planning Centre and the Air Command and Control Centre. At the end of January 1998, during a pre-handover visit to the GFS site, the GFS requested a number of additional building services works and fitting-out works to be carried out in the GFS Headquarters.

5.10 ***ArchSD's instruction for additional works.*** In early April 1998, the ArchSD passed to the Contractor some pieces of new information for designing and implementing the additional works. To gain time, the Contractor commenced the additional works on 15 April 1998, notwithstanding that the ArchSD only instructed the Contractor to implement the additional works at a later date, on 19 June 1998. The Contractor substantially completed the additional works on 22 June 1998.

Audit observations on other late changes and additional works

5.11 ***Grant of EOT and prolongation cost.*** Audit noted that, due to the late changes and additional works, the ArchSD had to grant an EOT of 74 days for the period 10 April 1998 to 22 June 1998, and had to pay a prolongation cost of \$5.1 million to the Contractor (see para. 5.1 above).

5.12 ***Delays in issuing instruction for implementing changes and additional works.*** Table 6 below shows that there were delays in issuing instruction to the Contractor by the ArchSD. In all of the cases, there was a significant lapse of time between the date on which the user departments requested the changes and the additional works, and the date on which the ArchSD issued the instruction to the Contractor for implementing the changes and additional works.

Table 6

**Delays in issuing instruction for implementing changes and additional works
(para. 5.12 refers)**

Changes Or additional works	Date user department made its request	Date ArchSD issued instruction to the Contractor	No. of days between (a) and (b)	EOT assessed by ArchSD (days) (Note 3)
	(a)	(b)		
Changes in the HKPF PABX Room and the workshops	Between 15.11.1997 and 23.1.1998 (Note 1)	7.4.1998	74	31
Changes in the GFS Radio Equipment Room and for the antenna poles	25.11.1997	7.4.1998	133	28
Changes in the GFS Main Frame Computer Room	19.9.1997	7.4.1998	200	39
Additional works in other GFS areas	31.1.1998	15.4.1998 (Note 2)	74	69

Source: Audit's calculation based on ArchSD's and GFS's records

Note 1: The last date on which the HKPF requested the changes (i.e. 23.1.1998) was used in determining the number of days between (a) and (b).

Note 2: As the Contractor commenced the additional works on 15.4.1998 (see para. 5.10 above), this date was used in determining the number of days between (a) and (b), instead of 19.6.1998 (see para. 5.10 above) which was the date on which the ArchSD issued the instruction to implement the additional works.

Note 3: In respect of the EOT assessed in each of these cases, the ArchSD granted to the Contractor an EOT of 74 days for the period 10 April 1998 to 22 June 1998 after taking into account the overlapping construction periods (see para. 5.1 above).

In these cases, the lapse of time ranged from 74 days to 200 days (see Column 4 of Table 6 above). As the EOT assessed by the ArchSD for the changes and additional works only ranged from 28 days to 69 days (see Column 5 of Table 6 above), Audit considers that if the ArchSD had issued its works instruction within the shortest possible time after the user departments requested the changes and additional works (Note 27), the Contractor would have been able to complete the additional works much earlier than 22 June 1998 (the substantial completion date of the Contract). The EOT of 74 days, covering the period 10 April 1998 to 22 June 1998, and the prolongation cost of \$5.1 million (see para. 5.1 above) could have been reduced.

5.13 *Requests for changes and additional works after the extended contract completion date.*

Audit noted that some requests for changes and additional works were made by the user departments after the extended contract completion date of 16 November 1997 (see para. 5.2 above). **Audit considers that, to avoid delay and the payment of prolongation costs, the ArchSD, together with the user departments, should have ensured that requirements for the additional works (such as interfacing works required by the user department's special equipment supplier) were finalised before an agreed cut-off date, so as to provide the Contractor with sufficient time to complete the required works.**

Audit recommendations on other late changes and additional works

5.14 Audit has recommended that, for additional works which are essential for the completion of a contract (e.g. interfacing works which are required by a user department's special equipment supplier), the Director of Architectural Services, should:

- (a) in coordination with the user department, ensure that the requirements for the additional works are finalised before an agreed cut-off date set by the ArchSD; and**
- (b) promptly instruct the contractor to implement the additional works so as to provide him with sufficient time to complete the required works.**

Response from the Administration

5.15 The Director of Architectural Services generally agrees with the audit recommendations as mentioned in paragraph 5.14 above. Regarding the audit recommendation:

Note 27: *Audit noted that the ArchSD originally intended to treat the changes and the additional works carried out after the extended contract completion period of 16 November 1997 as post-contract works instead of as Employer's Changes to the Contract.*

- (a) in paragraph 5.14(a) above, he has made comments similar to those in paragraph 2.33(b) above; and
- (b) in paragraph 5.14(b) above, he has said that there was delay in issuing instructions for the changes and additional works because the ArchSD, upon receiving requests from the user departments, had to:
 - (i) ascertain whether the requests were items that did not meet the contractual requirements or whether they were new or revised requirements;
 - (ii) seek clarification from the user departments on the details of the new or revised requirements, necessity for the works, and possible alternatives to minimise the extent of change;
 - (iii) obtain the Contractor's view on whether the requests could be incorporated at a stage when substantial parts of the building had already been completed; and
 - (iv) obtain the Contractor's Proposals and the estimated costs for consideration and agreement.

PART 6: RE-COATING OF THE GFS HANGAR FLOOR

6.1 This PART examines the re-coating of the hangar floor of the GFS Headquarters. The re-coating of the hangar floor was needed because the GFS found that the floor coating applied by the Contractor did not meet its operational requirement. The cost of re-coating the hangar floor was \$1.4 million (see para. 1.7 above). The audit has revealed that there are lessons to be learnt in contract administration and project implementation.

Coating for GFS hangar floor and some workshop floors

6.2 According to the Contract, the hangar floor and some workshop floors of the GFS Headquarters should be coated with epoxy paint. The Employer's Requirements stated that an epoxy paint or other equivalent and approved epoxy-based floor coating should be applied to the specified floors in accordance with the manufacturer's instructions. A brochure of the epoxy paint was attached to the Employer's Requirements. According to the brochure, the epoxy paint was colourless, but colouring was available on request. The ArchSD subsequently endorsed the use of the epoxy paint.

Dispute between GFS and ArchSD over colour of floor coating

6.3 In April 1998, the GFS raised its concern about the colour of the floor coating. The GFS informed the ArchSD that it came to its notice that the hangar and workshop floors were concrete-grey in colour, with a colourless hardener painted on top. The GFS said that the grey colour was too dark. The grey colour was a hindrance for engineering and repair work because it might not be easy to locate very minute tools and equipment put on the floor. The GFS said that:

- (a) the epoxy paint of the floor areas was supposed to be an off-white colour;
- (b) it had given such a requirement to the ArchSD on several occasions; and
- (c) the colour of the hangar floor of its Headquarters at Kai Tak was also off-white.

Accordingly, the GFS asked the ArchSD to repaint the hangar and workshop floors in an off-white colour. In response, the ArchSD said that there was no floor colour requirement indicated in the data sheets compiled by the GFS in March 1995 for the hangar and the workshops, and the ArchSD had no recollection of the GFS giving such a colour requirement in any previous correspondence or meetings. Nevertheless, the ArchSD said that it would consider the feasibility and the cost of repainting the floor in an off-white colour.

6.4 In early May 1998, the GFS informed the ArchSD that:

- (a) the GFS well remembered that there were discussions about the finishes required for the hangar and workshop floors;
- (b) after the initial compilation of the data sheets which specified the user requirements, the GFS had several meetings with the ArchSD. The GFS and ArchSD staff also visited the GFS Headquarters at Kai Tak to see those facilities which would have similar requirements in the new Headquarters at Chek Lap Kok; and
- (c) the initial data sheets compiled by the GFS had specified the use of epoxy paint which in itself implied a colour. The GFS had never suggested that the floors should have a clear coating. Instead, it was agreed that the coating for the hangar and workshop floors should have an off-white colour, similar to that used in the GFS Headquarters at Kai Tak, and that this would be determined after a suitable product and supplier had been selected (Note 28).

The GFS also informed the ArchSD that the GFS was a CAD Approved Maintenance Organisation, and accordingly the floor coating of its hangar and workshops at the new Headquarters should meet the colour requirement on both operational and safety grounds.

6.5 On 11 May 1998, noting that the dispute over the colour of the hangar floor coating might affect the on-time release of the GFS facilities at Kai Tak and hence the relocation of the Airport (Note 29), NAPCO urgently consulted the CAD. The CAD confirmed that the coating in an off-white colour of the hangar and workshop floors was only a “desirable enhancement and improvement but not a prerequisite” from its point of view. The CAD would allow the GFS to commence operation in its new facilities at Chek Lap Kok.

Re-coating of GFS hangar floor as improvement works

6.6 On 10 June 1998, the ArchSD informed the GFS that it would not be possible, under the Contract, to carry out the re-coating works of the hangar and workshop floors because the project

Note 28: *Audit noted that the ArchSD had not specifically requested the Contractor to prepare samples of floor coating for GFS's prior approval before the commencement of the works. If this had been done, it would have ensured that the requirements of the GFS would be met.*

Note 29: *According to the Airport Operational Readiness Programme, the GFS was required to release its facilities at Kai Tak on 22 June 1998 so as to make ready the relocation of the Airport to Chek Lap Kok.*

was near completion and the contract contingencies had been used up. The ArchSD advised that the re-coating works could best be done as a maintenance item.

6.7 On 22 June 1998, upon the relocation of the GFS Headquarters to Chek Lap Kok, the GFS put the hangar and the workshops into use.

6.8 In June 2000, the GFS obtained funding from the Minor Building Works Committee (Note 30) to carry out the re-coating works of the hangar floor (Note 31). In June 2001, the ArchSD appointed a new contractor to carry out the works. The new contractor submitted samples of floor coating to the GFS for the selection of colour and texture of the coating to be applied. **The works were completed in August 2001 at the cost of \$1.4 million.**

Audit observations on re-coating of the GFS hangar floor

6.9 According to the Contract, the hangar floor and floors of some of the workshops of the GFS Headquarters should be finished with epoxy paint. The epoxy paint was colourless, but colouring was available on request (see para. 6.2 above). There was no floor colour requirement indicated in the data sheets compiled by the GFS (see para. 6.3 above). The GFS considered that the specification of epoxy paint in itself implied that a colour paint would be used (see para. 6.4(c) above).

6.10 **Since the colour requirement of the hangar and the workshop floors was considered by the GFS as operationally critical to its aircraft maintenance activities, Audit considers that the GFS should have clearly stated in the data sheets the floor colour requirement in these areas and, if necessary, followed up in writing with the ArchSD on this matter.**

6.11 **Audit also considers that the ArchSD should have confirmed with the GFS before authorising the Contractor to coat the floors with the particular epoxy paint. This would have ensured that the completed works met the user department's requirements. Audit noted that the new contractor subsequently appointed to carry out the re-coating works had provided paint samples to the GFS before the works commenced.**

Note 30: *The Minor Building Works Committee, chaired by the Director of Architectural Services, examines minor building works proposed to be funded under the Capital Works Reserve Fund.*

Note 31: *No funding application for re-coating the workshops was made by the GFS. In October 2001, in a meeting with Audit, the GFS said that it would apply for funding to re-coat the workshops at a future date.*

Audit recommendations on re-coating of the GFS hangar floor

6.12 **Audit has *recommended* that the Director of Architectural Services should:**

- (a) **require a user department to state clearly its requirements, particularly those which may affect its operations critically (such as the colour of the coating of the hangar floor), so that the user's requirements can be clearly specified in the contract documents; and**
- (b) **before applying a construction material which is considered operationally critical to a user department, request the contractor to provide samples for examination and selection before the commencement of works.**

6.13 **Audit has *recommended* that the Controller, Government Flying Service should clearly specify his requirements, which are operationally critical (such as the colour of the coating of the hangar floor), to the works department in writing in order to avoid subsequent misunderstandings and disputes.**

Response from the Administration

6.14 The **Director of Architectural Services** generally agrees with the audit recommendations as mentioned in paragraph 6.12 above.

6.15 The **Controller, Government Flying Service** agrees with the audit recommendation as mentioned in paragraph 6.13 above.

General

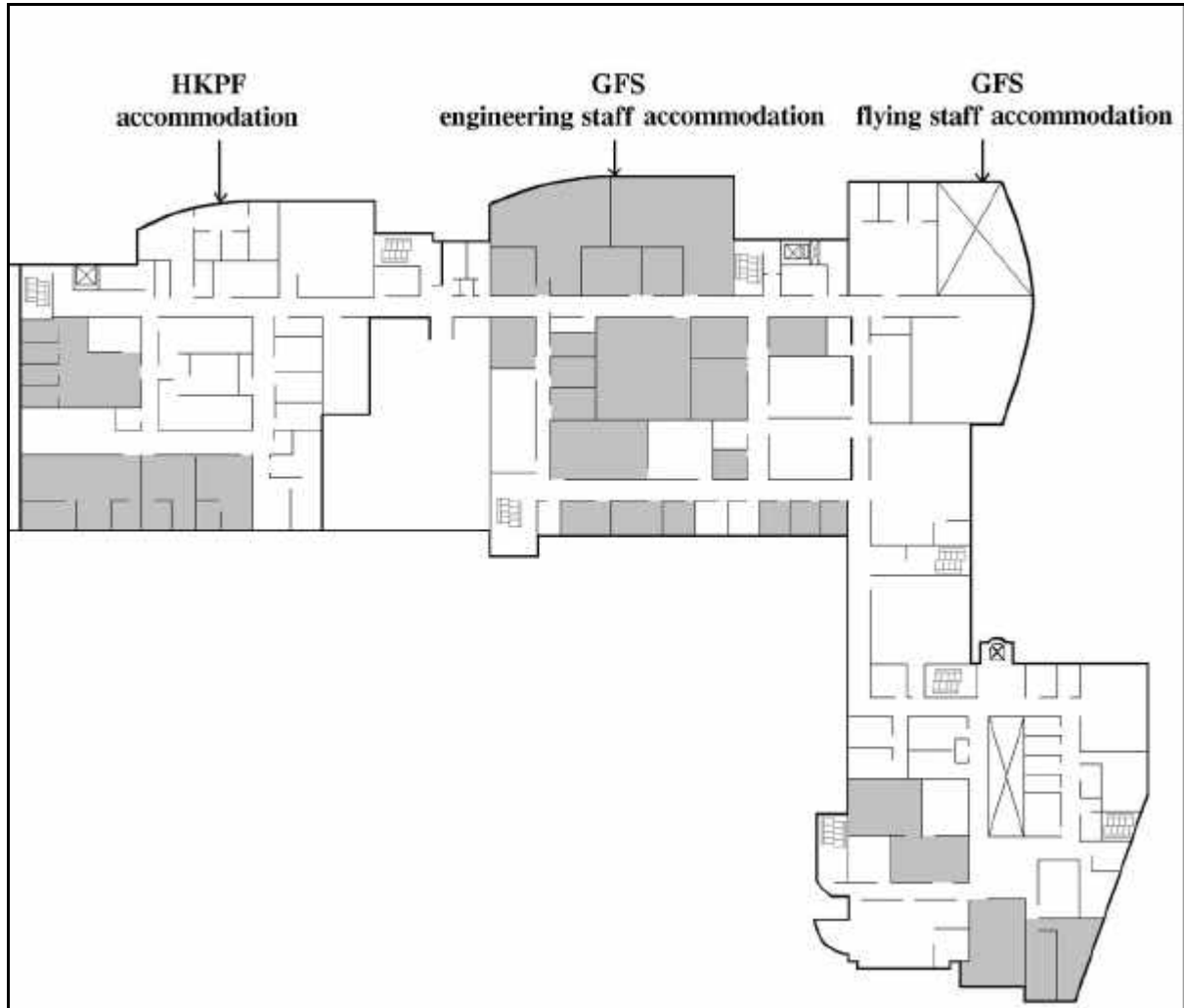
6.16 ***Audit recommendations for other works departments.*** Based on the lessons learnt from this report, other works departments may also benefit in improving their contract administration and project implementation of major capital works projects. **Audit has *recommended* that the Secretary for Works should consider notifying all works departments (e.g. by promulgating Works Bureau Technical Circulars) and user departments of the audit recommendations mentioned in paragraphs 2.14, 2.31, 4.22, 5.14, and 6.12 above, so as to avoid any recurrence of similar cases in future.**


Response from the Administration

6.17 The **Secretary for Works** welcomes the audit recommendations as mentioned in paragraph 6.16 above.

Appendix A
(para. 4.4 refers)

**First floor of the office building – room layout
according to the final design building plans approved by ArchSD on 3 October 1996**

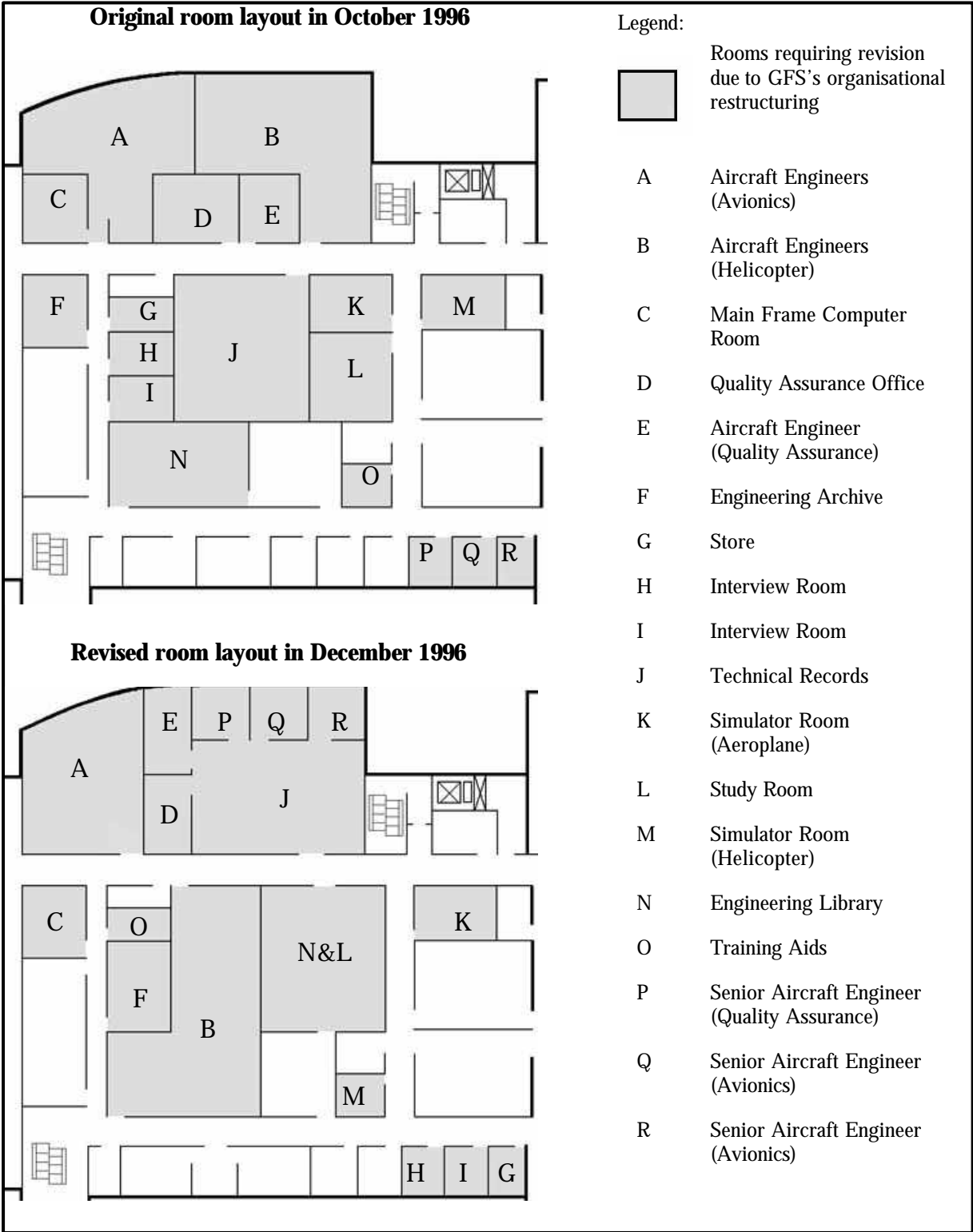


Legend:  Rooms requiring changes as requested by the HKPF and the GFS

Source: ArchSD's records

Appendix B
 (Item (c) of Table 5 in
 para. 4.12 and para. 4.19
 refer)

**Original and revised room layout of
 GFS engineering staff accommodation**



Source: ArchSD's records

Chronology of key events**Extension of site boundary and revision of apron layout**

September 1994	The GFS advised the ArchSD that it would require two helipads because it was essential to have one helipad on standby for its helicopter operations.
June 1995	The ArchSD sought agreement from the AA for extending the GFS northern site boundary so that the two helipads would be situated wholly within the GFS site.
September 1995	The AA agreed to the extension of the GFS northern site boundary by eight metres to the southern edge of the airside road.
October 1995	The Contractor commenced the contract works.
December 1995	The ArchSD requested the AA to hand over the extension area by 31 January 1996.
July 1996	The AA advised the ArchSD that the extension area would be made available by 4 November 1996, subject to the progress of the works of the AA's contractor.
July 1996	The ArchSD received from the Contractor a revised apron layout which incorporated the latest requirements of the GFS.
August 1996	At design meetings held on 9 August 1996 and 28 August 1996, the GFS, the ArchSD and the Contractor agreed the required further revisions to the apron layout drawings submitted by the Contractor.
September 1996	The ArchSD approved on 26 September 1996 the final revised apron layout which it received from the Contractor on 12 September 1996.
November 1996	The AA was not able to hand over the extension area because its contractor was still constructing the communication ducts and pits in the extension area.
March 1997	The AA handed over the extension area to the ArchSD. However, the communication ducts and a draw pit of the AA were not compatible with the proposed location of the surface channel at one of the helipads. Therefore, the Contractor had to revise the drainage design at the location of this helipad. As a result, the drainage works in the extension area were delayed.

Provision of additional tanker refuelling station and pipework

August 1996	The AA informed the ArchSD that the AA would facilitate its franchised supply tankers to access the GFS site from the airside. The AA said that it would inform the ArchSD of the progress, probably at the end of 1996.
August 1996	The GFS requested an additional tanker refuelling station to be located at the northwestern corner of the hangar. This would enable AA's franchised supply tankers to fill the GFS underground fuel tanks from the airside.
March 1997	The AA established a franchised arrangement for the supply of aviation fuel to the airlines.
March 1997	The ArchSD instructed the Contractor to construct the additional tanker refuelling station and pipework.
April 1998	The GFS informed the GSD that the AA's franchised arrangement for the supply of aviation fuel would not cover the GFS. The GSD subsequently renewed the bulk contract which covered the supply of aviation fuel for the GFS.
September 2001	The GFS initiated discussions with the GSD's fuel supplier for the supply of aviation fuel to the GFS through the AA's franchised fuel supplier in emergency situations.

Revisions of room layout and related building services provisions

October 1995	The HKPF informed the ArchSD that demountable partitions, instead of brickwork, should be used as partitioning walls between three of its workshops.
June 1996	The ArchSD informed the HKPF that to meet the target of the contract programme, the HKPF's comments on the revised building plans were urgently required by the Contractor.
July 1996	The ArchSD advised the GFS that, due to the tight contract programme, it had to freeze the design and obtain the complete comments of the GFS so that the Contractor could proceed with the detailed design.
July 1996	The ArchSD gave its Notice of No Objection to the set of preliminary design building plans submitted by the Contractor in June 1996.

August and September 1996	The ArchSD issued Requests for Employer's Change to cover the HKPF's requested changes in the PABX and LT Room, Security Room and Metal Workshop, and to cover the HKPF's request for a new LT Room in the General Office and the relocation of four partitioned offices.
October 1996	The ArchSD gave its Notice of No Objection to the complete set of final design building plans submitted by the Contractor in September 1996.
December 1996	The ArchSD issued a Request for Employer's Change to cover the changes requested by the HKPF in August and September 1996, and the HKPF's request to reduce the number of partitioned offices in the General Office from four to two, and to relocate them.
December 1996 to February 1997	The ArchSD issued Requests for Employer's Change to cover the changes requested by the GFS in the room layout of the engineering staff accommodation and the flying staff accommodation.
February 1997	The ArchSD issued a Request for Employer's Change to provide the demountable partitions between three of the HKPF workshops.
May 1997	The ArchSD gave its Notice of No Objection to the revised final design building plans submitted by the Contractor in April 1997.

Other late changes and additional works

September 1997	The ITSD, in a meeting with the GFS, the ArchSD and the Contractor, asked the GFS to request a number of changes to the building services works and builder's works in the Main Frame Computer Room.
November 1997	The GFS confirmed with the ArchSD the changes to the building services works and builder's works in the GFS Radio Equipment Room, and for the antenna poles on the rooftop of the office building to suit the radio equipment supplier's requirements.
November 1997 to January 1998	The HKPF requested a number of changes to the building services works and builder's works in the HKPF PABX Room and the workshops to suit the system supplier's requirements.
January 1998	During a pre-handover visit to the site, the GFS requested a number of additional building services works and fitting-out works.

April 1998	The ArchSD issued to the Contractor an Instruction for Employer's Change to cover the requested changes in the Main Frame Computer Room, the Radio Equipment Room, the HKPF PABX Room and the workshops.
April 1998	The Contractor commenced the additional works in the GFS Headquarters.
May 1998	The Contractor completed the required changes in the HKPF PABX Room, the workshops, the Radio Equipment Room and for the antenna poles.
June 1998	The ArchSD issued to the Contractor an Instruction for Employer's Change for the additional works being carried out in the GFS Headquarters.
June 1998	The Contractor completed the required changes in the Main Frame Computer Room and the additional works in the GFS Headquarters.

Re-coating of the GFS hangar floor

April 1998	The GFS informed the ArchSD that it noted that the hangar floor and floors of some workshops were concrete-grey in colour, instead of off-white. The GFS asked the ArchSD to repaint the floors in an off-white colour.
June 1998	Upon relocation of the GFS Headquarters to Chek Lap Kok, the GFS put the hangar and the workshops into use.
June 2000	The GFS obtained funding from the Minor Building Works Committee to carry out the re-coating works of the hangar floor.
June 2001	The ArchSD appointed a new contractor to carry out the re-coating works for the hangar floor. Prior to the commencement of the re-coating works, the new contractor submitted samples of floor coating to the GFS for the selection of colour and texture of the coating to be applied.
August 2001	The re-coating works were completed.

Appendix D

Acronyms and abbreviations

AA	Airport Authority
ArchSD	Architectural Services Department
CAD	Civil Aviation Department
EOT	Extension of time
GFS	Government Flying Service
GSD	Government Supplies Department
HKPF	Hong Kong Police Force
ITSD	Information Technology Services Department
LT	Line Termination
NAPCO	New Airport Projects Coordination Office
OFTA	Office of the Telecommunications Authority
PABX	Private Automatic Branch Exchange