

Chapter III Working mechanism for the planning and production of public housing units

Introduction

3.1 This Chapter aims to explain the working mechanism for the planning and production of public housing at both the macro and micro levels. At the macro level, the Select Committee has examined how public housing production targets have been determined over the years and how these targets have affected the operation of HA as the principal production agent and HD as its executive arm. At the micro level, the Select Committee has looked into the development process of public housing. Although HS is also responsible for the production of public housing, its buildings are subject to the BO and it therefore operates under a separate regime which will be explained in Chapter IV.

Public housing demand and public housing production targets

3.2 The primary aim of housing production is to meet housing demand. The first major policy statement which set out the methods and assumptions adopted by the Government in assessing housing demand was the LTHS promulgated by the then Housing Branch in April 1987. The 1987 LTHS estimated a total demand of 960,000 new units in the 14-year period from April 1987 to March 2001 with an annual average production of 40,000 units in the public sector and 30,000 units in the private sector. With reference to the policy framework and objectives of the 1987 LTHS, HA was to oversee the production of public housing units to satisfy public housing demand initially. Following the abolition of the Housing Branch on 1 April 1988, HA assumed full responsibility for implementing and keeping the 1987 LTHS under review, and planning, co-ordinating and monitoring the public housing programme.

3.3 In August 1990 an inter-departmental Working Group on Housing Demand was formed to advise on long-term housing demand on the basis of the endorsed methods and assumptions in the 1987 LTHS. The Working Group was chaired by Deputy Director of Housing (Construction). Between 1991 and 1993, the Working Group conducted annual reviews of the private and public housing demands based on the methods and assumptions set out in the 1987 LTHS. The public housing demand was then translated into production targets of the Government for implementation by HA.

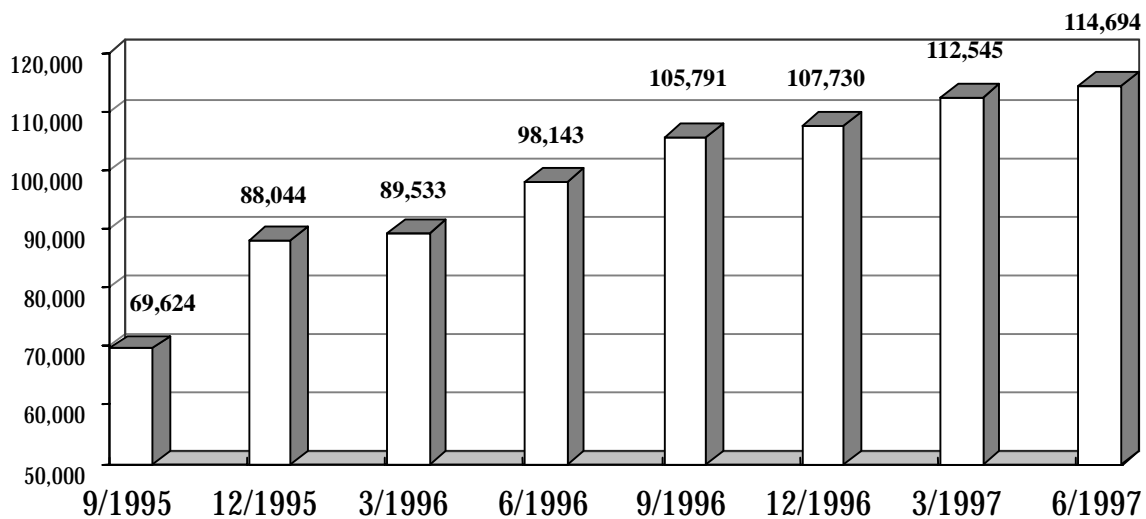
3.4 In 1993 HA conducted a mid-term review of the 1987 LTHS and published a report on the review in June 1994. The review concluded that an additional 50,000 public housing units were required between 1997/98 and 2000/01 to meet public housing demand. The 1994 report therefore recommended that HA's production targets should be increased over an eight-year period from 1994/95 to 2000/01. Following this mid-term review, the Government pledged in the 1994 and 1995 Policy Addresses to produce 141,000 public rental units and around 150,000 HOS/PSPS units before April 2001.

3.5 To translate the production forecasts into a production programme, HA compiles a Public Housing Development Programme (PHDP) on a quarterly basis which shows the forecast of public housing production over a period of eight years. PHDP is drawn up with reference to the supply of land provided by the Government to HA, the progress of HD's planning work and the progress of HA's ongoing housing projects. The PHDP in September 1995 showed that the production forecasts of HA for the six years up to 2000/01 were 296,730 units, with average production of 49,455 units between 1995/96 and 2000/01. In the following quarter, i.e. December 1995, the production forecasts up to 2000/01 rose to 315,735 units and had remained slightly below or above 300,000 units from then on until December 1997. These production forecasts were in line with the pledges made in the 1994 and 1995 Policy Addresses. Actual production however fell far short of the production forecast of 50,000 units per year. Between 1995 and 1999, the actual production was between 28,000 and 34,000 units per year, although the production reached 48,484 units in 1999/2000. The PHDPs between September 1995 and December 1997, and a summary of the public housing

units produced by HA from 1987/88 to 2000/01 are in **Appendices III(1)** and **III(2)** respectively.

3.6 As shown in Appendix III(2), the annual production of HA between 1988 and 1991 was in the region of 50,000 units. The annual production gradually dropped to 28,444 units in 1994/95, short of the PHDP forecasts. Owing to the inability to produce the forecasted number of units from the early 1990's onwards, the September 1995 PHDP showed that the production forecasts in 1999/2000 and 2000/01 were 69,941 units and 69,624 units respectively. The production forecast for 2000/01 increased in each of the PHDP update and reached a peak of 114,694 units in the June 1997 PHDP as shown in Chart 3.1.

Chart 3.1: Number of units to be produced in 2000/01 as reflected in the Public Housing Development Programme from September 1995 to June 1997



Causes for the production peak

3.7 What then caused the production peak? All the witnesses from the three authorities responsible for the planning and production of public housing units, i.e. HB, HA and HD, told the Select Committee that they were aware of the production peak as early as 1995.

3.8 Witnesses from HA reiterated that the irregular supply of serviced land by the Government in the 1990's was the major cause for the bunching of production. On various occasions, in particular in each of the covering letters that accompanied the six half-yearly reports on the work of HA to the then Governor between 1994 and 1996, CHA expressed her grave concern in this regard and urged for a steady and sufficient supply of land to HA. The message was particularly clear in the letter dated 23 December 1996 which said:

"The bunching of flat production at the end of the LTHS period is a direct result of an irregular supply of land to the Authority in the past years. I feel obliged to record that I do not think the current PHDP is realistic. Public and private sector production combined has rarely in the past exceeded 85,000 units in a single year. The PHDP shows 106,000 for the public sector alone in 2001."

3.9 The Select Committee notes that it had been a long standing arrangement between the Government and HA that the land supplied to HA should be serviced land. Serviced land refers to sites which have already been formed and are ready for commencement of building works. According to HD, the forming of land includes rezoning, resumption, clearance, site formation and the provision of infrastructure. The forming of land takes time, the length of which varies from site to site. Since the late 1980's, HA was provided with some un-serviced land, resulting in longer lead time to complete flat production and causing delays in meeting the production targets in PHDP.

3.10 The amount of land allocated to HA from 1990/91 to 1996/97, according to HA's calculations, is shown in Chart 3.2.

Chart 3.2: Amount of land allocated by the Government to Housing Authority between 1990/91 and 1996/97 according to Housing Authority's calculations

Year	Serviced Land (hectare)	Un-serviced Land (hectare)	Total (hectare)
1990/91	1.2	78.6	79.8
1991/92	0	7.6	7.6
1992/93	2.8	0	2.8
1993/94	13.9	38.0	51.9
1994/95	20.1	19.7	39.8
1995/96	8.2	39.6	47.8
1996/97	0.3	2.3	2.6

3.11 In the view of HB, land supply to HA was bound to fluctuate from year to year in view of the changing production targets in response to changes in housing demand, and the different lead time required for land production, planning and provision of infrastructure. The former S for H told the Select Committee that the Government had provided sufficient land to HA to meet flat production targets announced by the Government and that the HA did not rely solely on new land for its housing development, as a substantial proportion of its flat production came from redevelopment of existing sites. The reasons for HA's claim of a shortfall of land were that HA increased the safety margin from 5% to 10% in calculating the total land requirements, and it increased its production requirements based on in-house demand assessments. The former S for H said that before he took up the post, un-serviced land had been supplied to HA, but the Government had undertaken to reimburse HA for the land-forming costs involved. The amount of land allocated by the

Government to HA from 1990/91 to 1996/97, according to HB's calculations, is shown in Chart 3.3.

Chart 3.3: Amount of land allocated by the Government to Housing Authority from 1990/91 to 1996/97 according to Housing Bureau's calculations

Year	Formed sites (hectare)	Unformed sites (hectare)	Total (hectare)
1990/91	39.3	-	39.3
1991/92	15.4	1.5	16.9
1992/93	29.3	-	29.3
1993/94	22.9	2.1	25.0
1994/95	31.7	-	31.7
1995/96	54.3	17.4	71.7
1996/97	43.1	1.3	44.4

3.12 The former S for H explained to the Select Committee that the bunching of production in 2000/01 was not due to an inadequate or uneven supply of land, but slippage in the construction programme of HA in the early years. In December 1995, one year after the re-establishment of HB, in the light of the strong call from CHA, HA and LegCo to provide more land to HA, the Government allocated 30 hectares of land to HA to meet the increased production requirements as assessed by HA. Since then, especially after the setting up of the Steering Committee on Land Supply for Housing (HOUSCOM) chaired by the Financial Secretary, the disagreement between HA and HB concerning the supply of land to HA had been resolved.

3.13 As far as the supply of land is concerned, the Select Committee notes that it was originally the Subcommittee on Land Supply for LTHS which considered and decided the land requirement for public housing production with reference to the housing demand assessed by the Working Group on

Housing Demand. This Subcommittee was under the Land Development Policy Committee which was chaired by the then Chief Secretary. The Subcommittee was responsible for identifying new housing sites. In 1994, in response to public concern about the rapid increase in property prices, an inter-departmental Task Force on Land Supply and Property Prices under the chairmanship of the then Secretary for Planning, Environment and Lands was set up to examine the problem. Pursuant to the recommendation of the Task Force to strengthen co-ordination of government activities relating to land supply, HB was re-established in November 1994 and thereafter it assumed the responsibility for assisting HA in obtaining sites to meet the production targets.

Measures to deal with production peak

3.14 HB, HA and HD were all aware of the production peak as early as 1995 and had taken measures on different fronts to address the problem. At the Government level, at an internal meeting chaired by the Financial Secretary and attended by S for H and D of H in October 1997, it was agreed that a slight slippage of flat production by HA in 2000/01 would be acceptable, having regard to the fact that the production forecast for that year would exceed the Government's target and that a natural slippage might help meet the shortfall in production during subsequent years.

3.15 On the part of HA, it adopted a three-pronged strategy to deal with the anticipated bunching of production in 1999/2000 and 2000/01. The strategies were to create additional posts in HD to absorb the workload; reorganize D&CB of HD along project management lines and increase outsourcing work to consultants in the private sector. Each of these three strategies is elaborated below.

Creation of additional posts

3.16 With a staff establishment of about 14,000 in the first half of the 1990's, HD had over the years been able to produce about 35,000 to 40,000 units per annum. To cope with the anticipated production peak in 2000/01, HD increased its manpower strength and created a total of 686 posts during the

period from 1995/96 to 2000/01. Of these, a total of 245 posts were created in the works-related branches in HD during the period from 1995/96 to 1996/97. Breakdowns of the 686 posts and 245 posts created are in **Appendices III(3)** and **III(4)** respectively.

Reorganization of Development and Construction Branch

3.17 At the organizational level, HD reorganized D&CB to cope with the anticipated increase in the production targets pursuant to the recommendations in the Business Process Re-engineering Study (BPR)⁵ commissioned in February 1996. In this respect, BPR recommended the creation of the posts of dedicated project managers in HD which might be filled by professional staff of any disciplines. The recommendations in BPR were accepted by HA, and D&CB was reorganized from a functional-based set-up to a process-oriented structure in November 1997. Project management teams were set up to oversee the entire public housing development process.

3.18 In March 1999, D&CB was further reorganized on a regional basis into four Divisions. Each of these Divisions was given functions in project management, works and consultant management .

3.19 The structure of D&CB before and after the reorganization in November 1997, and in March 1999 are explained in paragraphs 2.32 to 2.34.

3.20 The reorganization of the D&CB with dedicated project manager posts open to any disciplines was supported by professional staff of different disciplines in HD, except architects who used to have the overall responsibility of project management and contract administration.

⁵ BPR was undertaken by Coopers and Lybrand to examine the new works processes with the aim to enhance project management, amongst others. (See paragraph 2.33).

Outsourcing of design and contract administration work

3.21 As a matter of policy, HA has all along engaged consultants in the private sector to supplement in-house resources. In the early 1990's, projects were outsourced to consultants on a very limited scale and mainly to supplement the needs in individual professional disciplines. As a measure to deal with the anticipated production peak in 2000/01 and on the basis of the standard lead time of four years from planning to completion of a project, BC decided in mid-1995 to outsource 21 projects comprising about 32,000 units. The number of such projects increased in February 1996 to 22, aiming to produce 35,600 units. Apart from approving the outsourcing of a substantial number of projects to consultants, BC also endorsed that outsourcing should commence from the design stage to completion of a project. The number of units outsourced for the period from 1993/94 to 1999/2000 is shown in Chart 3.4.

Chart 3.4: Number of units outsourced between 1993/94 and 1999/2000

Year	Number of units outsourced	Percentage of total number of units under design or construction
1993/94	Nil	NA
1994/95	5,216	9%
1995/96	35,357	33%
1996/97	1,788	26%
1997/98	16,966	29%
1998/99	32,839	42%
1999/2000	20,979	52%
Total	113,145	NA

3.22 The Select Committee notes that consultants, especially those in the first and second batches of outsourced projects, took over the housing projects from in-house staff at different stages of works. The consultants, through an architect-led consultancy arrangement, were required to line up other consultants from relevant disciplines to deliver their services, except quantity surveyors who were separately appointed by HA. Such an arrangement, according to HD, provides a one-stop service and a clear line of responsibilities. Staff engaged or deployed by the consultants to undertake housing projects are regarded as an extension of HD staff. Their role and responsibilities are supposed to be the same as those of HD in-house staff who perform the same duties. They also have to follow the same procedures and achieve the same standards as required of HD staff undertaking in-house projects.

3.23 Prior to November 1997, the core functions of selection, appointment, management and performance appraisal of architect-led consultancies were performed on a discipline basis. Following the reorganization of D&CB in November 1997 as described in paragraph 3.17 above, consultant management was re-aligned. A multi-disciplinary team led by a Chief Architect was set up for the selection, appointment and auditing of the lead consultants and sub-consultants. Another team was tasked with the day-to-day management of consultants, such as monitoring the progress of consultants' work, fee processing as well as providing guidance on submissions to committees of HA. In June 1998, when the majority of consultant projects proceeded to detailed design, tender documentation and commencement of works, these two teams were merged to become the Consultant Management Section under the leadership of a chief architect.

3.24 For the purpose of managing consultants, HD drew up the First Edition of the Consultant Management Manual (known in HD as BCM) in early 1993, which set out the procedures, practices, and guidelines for listing, selection, appointment, control and management of consultants. Two later editions of BCM were issued in February 1995 and April 1998. While the contents of the Second Edition BCM were essentially the same as those of the First Edition except to reflect organizational changes, the Third Edition was significantly different from the Second Edition due to the change of consultant management from discipline basis to multi-disciplinary basis. Between 1995

and 1998, there were also four revisions made to BCM to reflect changes of post titles and to clarify procedures. A brief history of the issue of BCM and guidance notes on consultant management for the period from 1993 to 1998 is in **Appendix III(5)**. Although HD issued guidance notes to all officers involved in consultant management, it did not organize any workshop or seminar to familiarize its staff with changes concerning consultant management and BCM. This may explain why some HD staff told the Select Committee that they were not entirely clear about and could not catch up with the changes in consultant management and the manuals.

Development process of public housing

3.25 For a typical public housing project, be it an in-house project or an outsourced project, there are six stages of development, namely, site identification, feasibility study, design, tender, foundation construction and building construction. Before October 1997, the standard lead time for a typical housing project from inception to completion was 62 months. This time frame was shortened to 47 months upon the setting up of HOUSCOM, as it was expected that the lead time for production would be substantially reduced with the streamlining of the site identification process. The actual time for construction remained unchanged, i.e., nine months for piling and 28 months for building. A flow chart showing the time assigned for each stage of development under the 62-month and 47-month time frames is in **Appendix III(6)**. The key activities and the parties involved in each stage of development for an in-house project and an outsourced project, as shown in the flow charts in Appendices II(3) and II(4) respectively, are explained below.

Site identification

3.26 Most public housing sites are identified through the various planning and development studies undertaken by the Planning Department and other Government departments. Some are identified through ad hoc technical studies conducted by HD. The sites identified are endorsed by the Committee on Planning and Land Development chaired by the Secretary for Planning and Lands (after June 2002, the Secretary for Housing, Planning and Lands).

Since 1997, these sites are incorporated into a production forecast monitored by HOUSCOM.

Feasibility study

3.27 Once the sites are considered to be viable for public housing development, they are shortlisted by HD for detailed feasibility studies. A project manager is designated within HD to head a multi-disciplinary team to undertake relevant technical studies and to draw up development parameters and conceptual layouts. Since 1997, the key development parameters have to be approved by the Strategic Planning Committee before the relevant sites are included into PHDP.

Design

3.28 Following approval by the Strategic Planning Committee of the key development parameters of a housing project, the design stage begins.

3.29 For an in-house project, a Design Team starts to prepare the master layout plan and the development budget. The team usually comprises an architect, a structural engineer, a geotechnical engineer, a civil engineer, a building services engineer and a quantity surveyor. The Design Team Leader is a chief architect. He liaises with the relevant sections within HD, public utilities and other Government departments in respect of their respective detailed requirements. In parallel, the project geotechnical engineer of the Design Team commissions site investigations and prepares a foundation advice report. The foundation advice report sets out the site conditions, the feasible piling options and the precautions for using different types of piles.

3.30 The master layout plan and the development budget are then submitted to the Project Design Review Committee of HD for endorsement before their submission to BC. The Committee is headed by the Business Director of Development. BC members are co-opted into the Committee from time to time. After obtaining BC's approval on the master layout plan and the development budget, the Design Team Leader prepares the detailed design for the departmental Detailed Design Review Panel for approval.

3.31 The procedures involved at the design stage are the same for both in-house projects and outsourced projects. The only difference is that for an outsourced project, the architect-led consultant assumes the role of Design Team Leader.

Procurement of consultants

3.32 As explained in paragraph 3.22 above, HD traditionally adopts the architect-led consultancy arrangement for outsourced projects. The exact point in time during the development of a project at which consultants are appointed varies from project to project. Some are appointed at the design stage and some at the tender stage. Prior to mid-1995, HA appointed consultants for its projects on a rotation basis from a list of consultancy firms established by the Architectural and Associated Consultants Selection Board. The levels of remuneration of these consultants were based on the fee scale promulgated by the professional institutions concerned. In July 1995, HA adopted the negotiation fee system, under which shortlisted consultancy firms were required to submit their proposed schedule of staff resources and staff remuneration in respect of a particular project. They were then ranked according to the merits of their submissions. Negotiation began with the firm which was given the top ranking. This negotiation process continued down the list of shortlisted firms until agreement was reached with one of them.

3.33 The fee negotiation system was changed to a two-envelope system in September 1997, under which shortlisted consultants are required to make a technical submission and a fee submission. The two submissions are assessed independently of each other. The relative weighting apportioned between technical submission and fee submission was at first 50:50. For projects requiring a high design input, the weighting was adjusted to 70:30 in November 1998 and further to 80:20 in August 2000. The appointment of consultants has to be approved by BC.

Tender

Preparation of tender documents

3.34 Upon approval of the detailed design, the contract team proceeds to prepare the tender documents. For a piling contract, the contract team, comprising a project structural engineer and a project quantity surveyor, is headed by a contract manager who is a chief structural engineer (CSE). As for a building contract, the contract manager is a chief architect, and the contract team comprises a senior architect, a project architect, a project structural engineer, a project building services engineer and a project quantity surveyor. For an outsourced project, the lead consultant assumes the role of a contract manager and is supported by sub-consultants lined up by him and a quantity surveyor who is either a HD in-house staff member or a separate consultant appointed directly by HA.

3.35 Different tender documents are used for foundation projects depending on whether it is an engineer's design ⁶ or design-and-build ⁷ mode contract. For an engineer's design piling contract, the details as to how the foundations are to be built, including the type, number and depth of piles to be installed, are specified in the tender documents. For a design-and-build piling contract, only the pile types are specified in the tender documents for selection by tenderers. It is up to tenderers to propose and justify how their proposed piling designs fulfil the acceptance criteria. The Select Committee notes that almost all piling contracts awarded between 1995/96 and 1999/2000 were of design-and-build mode. As for the superstructure, nearly all (99%) contracts were of engineer's design mode.

3.36 Piling contracts, irrespective of whether they are based on design-and-build or engineer's design, can be executed under a lump-sum contract or a re-measurement contract. Under a lump-sum piling contract, the contractor undertakes to execute a defined piece of piling works in consideration of the

⁶ This refers to foundation works designed by the engineer employed by HA and to be constructed by a contractor.

⁷ This refers to foundation works to be designed and constructed by a contractor in accordance with the technical requirements specified by the engineer employed by HA.

receipt of a pre-determined lump-sum. Provided that the performance requirements or the scope of piling works are not varied by HA after the award of the contract, the contractor is paid the agreed amount, even though the quantities of piling works eventually executed may be greater or less than those estimated by the contractor at tender. Between 1991 and 2000, the vast majority of HA's piling projects were based on design-and-build awarded as lump-sum contracts.

3.37 Under a re-measurement contract, the contractor is paid in accordance with re-measured quantities of piling works actually carried out by him in implementing the specified design. The re-measured quantities are valued at the unit rates submitted by the contractor in his tender. Contractors executing re-measurement contracts therefore do not have to bear the same quantity risk as that borne by contractors executing lump-sum contracts. Since 2001, more HA's piling projects were based on engineer's design and let out as re-measurement contracts. From April to November 2002, all HA's piling projects were awarded under this mode of contract.

3.38 Irrespective of whether the project is of design-and-build or engineer's design type, the construction time for completion of the works is specified in the tender documents. For a piling project, the standard construction time was originally nine months and was extended to 10 months from March 2000 onwards. As for building contracts, the standard construction time was 28 months before 1998. In 1998 it was shortened to 27 months, and in March 2000 was extended to 29 months.

3.39 Notwithstanding the standard construction time frame, HD adopted a new tendering arrangement in April 1994 to allow tenderers to propose a shorter construction time. Under this arrangement, tenderers were required to submit a basic tender, called Tender A, with an option of submitting an alternative tender, Tender B. Tender A was based on the construction time specified in the tender documents. Tender B, if any, was for proposing a shorter construction time of normally not less than 24 months, which is the minimum construction time for standard full-height blocks set by HD. To reflect the benefit of earlier completion under Tender B, the price of each Tender B was adjusted with reference to the amount of liquidated damages in

accordance with an established formula to arrive at a discounted value. The discounted values of Tenders B would then be compared with the prices of Tenders A when assessing tenders. According to HD, this arrangement was to encourage contractors to develop more efficient and cost effective construction techniques. Originally, this Tender B option applied to building contracts only. It was extended to piling contracts in October 1997. The shorter construction time for piling contracts should not be less than the minimum period as specified in the tender document prepared by HD or its consultant.

Invitation and assessment of tenders

3.40 Since 1990 HA only invites tenders for works from the approved lists of contractors drawn up by itself or the Works Bureau for the purpose. There are usually six weeks between invitation for and return of piling tenders. For building tenders, the time allowed for return of tenders was four weeks but was extended to six weeks after 1999. All the tenders received are checked by the contract team for accuracy of calculation and for technical compliance with the specification. Normally only the three lowest tenders will be subject to detailed scrutiny with respect to technical and financial viability. If a tenderer is financially assessed to have insufficient capital for the contract, he would still be recommended to BC for consideration. Provided he is able to obtain a bank facility covering the contract within 24 hours, he would still be awarded the contract.

3.41 After assessment of the tenders, a paper with recommendations on the award of contract is submitted by HD to BC for consideration. The tender paper provides a gist of the three lowest tenders. Details of the tender assessment are contained in a tender report prepared by the quantity surveyor. That report is made available to BC members upon request. Most of the piling contracts of projects, even if they are the design-and-build type, are considered to be relatively simple and are therefore regarded as straightforward items not requiring discussion by BC, unless so requested by its members. Before 2000, HD could also award a contract by itself without submission to BC for approval, provided that the contract sum did not exceed \$50 million. Since January 2000, tender papers on piling works have to be submitted to BC regardless of their contract values.

3.42 According to the senior management of HD and the past Chairmen of BC who had given evidence before the Select Committee, price is not the governing factor in awarding HA's works contracts. In awarding works contracts, tenderers' past performance, financial capacity, workload, technical proposals and risk factors are also considered. However, records show that around 90% of contracts awarded by HA between 1996 and 1999 were to the lowest tenders. The percentage has been slightly reduced after the introduction in September 1999 of the Preferential Tender Assessment System (PTAS), under which tenderers' performance in the preceding six months makes up 20% of the composite tender score. Between 1999 and 2002, around 85% of contracts awarded by HA were still given to the lowest tenders. A summary of the percentage of works contracts awarded by HA to the lowest tenders for the period from 1995/96 to 2001/02 is in Chart 3.5.

Chart 3.5: Percentage of works contracts awarded by Housing Authority to the lowest tenders between 1995/96 and 2001/02

Year	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01	2001/02
No. of contracts awarded	157	242	276	158	91	57	54
No. of contracts awarded to the lowest tenders (percentage)	146 (93%)	226 (93%)	248 (90%)	142 (90%)	83 (91%)	47 (82%)	45 (83%)

3.43 During the mid-1990's, rarely were tenders excluded even if the tender prices were considered too low for the works required. The reason put forward by HD is that tenderers might have their own way to make their tenders financially viable. Although HD's standard tender reporting format shows that a comparison is made between the tenders received and the pre-tender estimates, the Select Committee does not find that HD had critically assessed whether the tender prices were unrealistically low for the works

required. The former D of H admitted that normally contracts were awarded to the lowest tenders.

Construction

Management of contracts

3.44 When construction commences, the contract team oversees the contract and monitors the performance of the contractor in meeting contract requirements.

3.45 The project structural engineer and project architect who assume the role of project co-ordinator in a piling contract and building contract respectively are the front-line professionals in managing a contract. According to HD's workload indicator, in general a project structural engineer and a project architect are each responsible for two in-house active projects. They are also required to handle other ancillary duties. **Appendix III(7)** shows that the actual workload of architects and structural engineers for the period from 1995/96 to 2000/01 ranged from 1.7 to 2.1 projects and from 1.4 to 2.3 projects respectively. The workload of senior structural engineers ranged from 6.9 to 12.7 projects. The workload of CSEs ranged from 41.5 to 70 projects.

3.46 In the case of an outsourced project, while the responsibility for managing the contract falls on the lead consultant and its sub-consultants, HD staff are deployed to monitor the performance of the consultant. According to HD, when consultant management on discipline basis was in force, one professional from each of the architectural, structural engineering and building services engineering disciplines could manage four active projects or eight inactive projects. The workload of HD professional staff responsible for consultant management on discipline-basis in 1996/97 was as follows:

<u>Disciplines</u>	<u>No. of outsourced projects managed by each professional</u>
Architectural	5.4
Structural engineering	3.9
Building services	8.8

3.47 After consultant management was changed to a multi-disciplinary mode of operation, the workload of professional staff of the architectural, structural engineering and building services disciplines tasked with consultant management was as follows:

<u>Year</u>	<u>No. of outsourced projects managed by each professional</u>
1997/98	7.1
1998/99	3.9
1999/2000 onwards	2.7

3.48 Irrespective of whether a project is administered by HD in-house staff or consultants, the contract team is not resident on site. Monitoring of the standards of works carried out on site by the contractor is effected mainly through supervision by resident engineers in some projects and/or by other site staff in most cases.

Site supervision

➤ *Resident engineer*

3.49 The resident engineer system was established by HD in 1986. Depending on the complexity and remoteness of the sites as determined by a CSE, a project resident engineer may be deployed to specific sites. For in-house projects, resident engineers do not have a separate establishment, but come under the central establishment of structural engineers. For outsourced projects, resident engineers are hired on a need basis. They are employed by the consultants on behalf of HD. The qualifications of resident engineer are the same for both in-house and outsourced projects.

3.50 The number of in-house piling sites for which resident engineers were deployed during the period from 1994/95 to 1999/2000 is in **Appendix III(8)**. The percentage of piling projects with resident engineers dropped from 47% in 1996/97 to 14% in 1998/99. The Select Committee notes that the proposal to deploy a resident engineer to every piling site was first made in 1990 by a CSE. In 1996 the Housing Department Structural Engineers Association proposed the establishment of a Resident Engineer System. However, it was not until April 2000 that HD made it a standing arrangement to deploy a resident engineer to every piling site.

➤ *Other site staff*

3.51 Under HD's organizational structure, the recruitment, deployment and appraisal of site staff other than resident engineers fall within the responsibility of the Chief Technical Officer Unit under the architectural discipline. Site staff for in-house projects come from two streams, namely inspector of works (IOW) grade and clerk of works (COW) grade. The entry qualifications for the various ranks in IOW grade and COW grade are in **Appendices III(9)** and **III(10)** respectively. The entry qualifications for comparable ranks in the two grades are largely the same, except that academic qualifications in civil engineering are considered relevant for appointment to the IOW grade.

3.52 HD first created the IOW grade in 1981 for the purpose of inspecting civil engineering, site formation, and ground investigation works. The establishment of the grade when created comprised only 10 posts. HD first deployed the IOW grade for the inspection of piling projects in 1989/90 and six staff in the IOW grade were recruited for the purpose. The intention then was that the IOW grade should look after complicated piling projects. The IOW establishment for piling projects remained at six in the 1990's until August 1998 when it was increased to 13. In September 1999, the IOW grade was further expanded by the creation of an additional 45 posts to inspect piling and demolition works. For the majority of piling projects, staff from the COW grade were deployed for site inspection. The arrangement remained so until 2000 when staff from the COW grade are deployed only to building

projects and inspectorate duties for all new piling projects fall on the IOW grade.

3.53 As shown in Appendices III(9) and III(10), the IOW and COW ranks are promotion ranks for assistant inspectors of works (AIWs) and assistant clerks of works (ACWs) respectively. In-service works supervisors (WSs) who have several years' relevant experience may be appointed as AIWs or ACWs. Generally speaking, those who assume the posts of IOWs, AIWs, COWs or ACWs should have accumulated several years of works experience on site, but it does not mean that their experience is necessarily related to foundation works. WSII is the basic rank of site staff.

3.54 The site staff for outsourced projects are employed by the lead consultants on behalf of HA on a project basis and they are required to attain the same entry qualifications as of the COW grade stipulated in Appendix III(10). However, as the site staff for outsourced projects are employed on a project basis, the posts of COWs or ACWs are filled by direct entry. For ACWs, the entry qualifications include academic qualifications and three years' post-qualification experience but it is not a mandatory requirement to have experience relevant to the type of piling or building works they are recruited to supervise. The site staff for outsourced projects, moreover, do not come within the management of the Chief Technical Officer Unit, which oversees the deployment and training of site staff.

3.55 According to HD manuals, the normal establishment of site staff for a piling contract includes an ACW and a WS. As for a building contract, basically one COW is deployed for one contract but the numbers of ACWs and WSs vary according to the number of blocks to be constructed. Prior to August 1998, the manning scale was that there should be 0.4 ACW and 1 WS per block. Thereafter, the manning scale was changed to 0.5 ACW and 0.9 WS per block.

3.56 The Select Committee notes that during the period between 1996 and 1999 when bunching of production was experienced, the workload of in-house site staff for building (superstructure) contracts, as discerned from **Appendix III(11)**, far exceeded the indicators. The workload of site staff for

piling contracts, as shown in **Appendix III(12)**, was comparable with the indicators. The Select Committee has been informed by HD that as the airport core programme was in full swing in the mid-1990's, there was a serious shortage of site staff in the entire construction industry. To resolve the shortage of site staff at the lower rank between 1994 and 1997, HD recruited 50 Form Five students on contract terms who, after attending a one-year training course provided by the Construction Industry Training Authority, were deployed to sites to work as works supervisor trainees.

Quality control and assurance

3.57 Given the large quantity of housing units produced by HA annually, HD adopted a number of measures to ensure the quality of its projects. For the purpose of this report, only those measures relevant to the four incidents examined by the Select Committee are set out in this Chapter.

Manuals

3.58 To ensure consistency in the way projects are delivered, HD has over the years compiled a large number of works manuals to provide guidance to in-house staff and consultants. To mention but a few, these manuals include Quality Management System Manual, Project Procedures Manual, Contract and Tender Procedures Manual, Construction Management Manual, Site Inspection Manual (Engineering), Site Inspection Manual for Building Works, and BCM. These manuals, compiled by individual disciplines or professional sections in most cases, set out in fairly great detail almost every type of works, the activities to be done at each stage of development and how the work should be done. By following the procedures laid down in the manuals, it is expected that the quality of work could be assured in both in-house and outsourced projects. The manuals are written in English and are updated from time to time by the relevant professional disciplines, sections and divisions. There is however no standing arrangement in HD to brief the staff concerned on the amendments to the manuals.

International Organization for Standardization (ISO) Certification

3.59 Apart from manuals, HD's then New Development Branch was certified to ISO 9000 in 1993 and its listed contractors are required to achieve similar certification since 1994. Since 1995 HA takes into account the ISO certification in selecting consultants to undertake outsourced projects. ISO certification requirement has become mandatory for architectural consultants since November 1997, and for structural and building services sub-consultants since mid-1998. For the purpose of complying with the requirements in ISO 9000, a large number of forms have been devised by HD for use by staff to enable proper documentation and checking. For the purpose of illustration, Site Inspection Manual for Building Works lists out 85 types of forms to be filled/signed by site staff and/or professional staff in the course of building works.

Audit/independent checking

3.60 It was not until 1998 that HD put on trial a second party audit system for both in-house and outsourced projects. The second party audit system was formally introduced in April 1999. Audits are conducted by HD staff independent of the project team on architectural, structural and building services engineering works in accordance with the audit programme to provide an objective assessment of the performance of the project team in terms of project quality, programme and budget control at various critical stages of development. The audit results are submitted to BC on a half-yearly basis.

3.61 The Independent Checking Unit was established under the direct supervision of D of H in November 2000 to carry out checks similar to those currently conducted by the Buildings Department on private building works.

Sanctions

3.62 Buildings belonging to the Government have been exempted from the BO since 1955 when it was enacted. This exemption was extended to buildings upon any land vested in HA when the Housing Ordinance, which established the HA, was enacted in 1973. As HD was to provide executive

support to HA in the planning and implementation of its public housing programmes, the criminal sanctions provided in the BO are not applicable to HD staff and consultants undertaking HA's works.

3.63 To enforce sanctions against HD staff for alleged professional misconduct or negligence, HD essentially follows the procedures established by the Civil Service Bureau. Depending on the nature of the incident and the severity of the consequences, ad hoc panels may be set up to conduct investigations into specific cases. If there is evidence to suggest a prima facie case of professional misconduct or negligence of HD staff, HD would commence disciplinary proceedings in accordance with the procedures laid down in the Procedural Manual on Discipline issued by the Civil Service Bureau. Since the establishment of the computerized database of HD on disciplinary proceedings in 1989 and before the coming into light of the four incidents, disciplinary proceedings had been instituted on two occasions in relation to alleged professional misconduct or negligence of HD professional staff. The Government, in its capacity as an employer, is not legally obliged to report suspected cases of professional misconduct to the respective professional institutions.

Quality Housing Reform

3.64 Since April 2000 HA has implemented by two phases 50 initiatives under 11 pillars to enhance public housing quality. These 11 pillars cover the following aspects:

- (a) providing quality products and services to customers;
- (b) revamping the piling process;
- (c) reinforcing site supervision;
- (d) reforming listing and tendering practices;
- (e) establishing a partnering culture;

- (f) re-engineering departmental operations;
- (g) reinforcing partnering culture;
- (h) enhancing quality monitoring assurance;
- (i) reinforcing third-party control;
- (j) uplifting professionalism; and
- (k) improving productivity.

3.65 A list of the 50 initiatives and their implementation status is in **Appendix III(13)**.

3.66 The effectiveness of these measures in addressing the problems uncovered in the four incidents will be examined in Chapter IX under "Conclusions and recommendations".