Chapter VII Incident No. 3 - Tung Chung Area 30 Phase 3

Introduction

7.1 Tung Chung Area 30 is situated in Phase II of the North Lantau Development. The whole area was developed in four phases. Phase 3 comprised four 41-storeyed HOS Concord 1 (Option 2) blocks, providing 1,280 domestic units and associated external works. The term "TC" in this Report stands for the superstructure development in Tung Chung Area 30 Phase 3 only.

7.2 The Foundation Contract of TC was completed on 24 July 1998, followed by the commencement of the Building Contract on 30 July 1998. On 24 May 2000, ICAC arrested six staff members of the Building Contractor, Cheung Kee Fung Cheung Construction Co. Ltd (CKFC), for suspected corruption involving the use of five batches of steel reinforcement bars which failed the sampling tests specified by the Contract. The Construction Manager, the QCE (from 4 December 1998 to 7 July 1999) and a director of CKFC were subsequently charged of conspiracy to defraud. The first two were convicted and sentenced to imprisonment of 3½ years and 21 months respectively. The Construction Manager has subsequently lodged an appeal against both conviction and sentence, and the QCE has lodged an appeal against sentence. The director of CKFC was acquitted after trial. In August 2002, the Site Agent and another QCE (from 8 July 1999 to 11 August 1999) were also charged with conspiracy to defraud.

7.3 To ascertain the effect of the non-compliant steel reinforcement bars on the structural safety of the development, HD conducted an inspection to locate the steel reinforcement bars of the batches which failed the sampling tests. The suspected substandard steel reinforcement bars were found and tested to have complied with the Specification. HD also commissioned an independent consultant, CMW, to check the structural safety of the buildings and the findings confirmed that the structural adequacy of the buildings had not been compromised. The Building Contract was completed on 29 March 2001.

7.4 As in the SY case, the focus of the Select Committee in the TC case is on the mechanism, if any, for ensuring the use of materials in compliance with the Contract, and the materials in question in this case are steel reinforcement bars. This Chapter examines the ways in which steel reinforcement bars in the TC project were handled and the reasons why steel reinforcement bars which failed the sampling tests could have been used in the permanent structures. A chronology of activities relating to the batches of steel reinforcement bars concerned is in **Appendix VII(1)**.

Planning and design

7.5 The TC project went through the planning and design stages in the normal manner. The client brief, control plan and project estimate for Tung Chung Area 30 were approved by BC on 23 March 1995. Two revisions were subsequently made to the above papers owing to the change in design of the development and increase in the development ratio. On 23 January 1997 BC approved the scheme design and project budget for Tung Chung Area 30 Phase 3. The approved project budget was $821.092 million, based on the price level of June 1996. This was updated in December 1997 to $915.096 million, based on the June 1997 cost yardstick, of which $848.231 million was allocated for the Building Contract.

Tendering

7.6 On 6 February 1998, HD invited nine selected contractors on the HA List of Building Contractors for Building (New Works) Group NW2 to tender for the TC project. Tenderers were required to submit a basic tender (Tender A) for a construction period of 26 months, with the option to submit an alternative tender (Tender B) proposing a shorter construction period of not less than 24 months (see paragraph 3.39). Among the seven tenders received by HD, CKFC submitted both Tenders A and B in the same amount of $760.903 million. CKFC's Tender B was the lowest among the tenders received. Notwithstanding that CKFC had received five adverse reports in relation to two

ongoing projects over the past 12 months as at 23 April 1998, HD recommended the award of the TC Contract to CKFC.

7.7 According to HD, although there was no hard and fast rule on the effect of adverse reports on the assessment of tenders, the performance of the contractor, including the nature and seriousness of adverse reports, would be taken into account in the process. When BC considered the tender paper at the meeting on 21 May 1998, BC members noted that CKFC had received two additional adverse reports after 23 April 1998. The minutes of the meeting did not show any detailed discussion among BC members on the seven adverse reports. However, the BC Chairman who chaired the meeting told the Select Committee that BC members had considered the issue of adverse reports on CKFC. He explained that the nature of the TC project was different from those two projects in which CKFC had received adverse reports and that CKFC had performed satisfactorily in terms of early completion of a recent project in Tseung Kwan O. BC approved the award of the TC Contract to CKFC with the full awareness that the Contractor had a total of seven adverse reports over the 13 months before the date of the BC meeting.

Management of the project

The Contract Team

7.8 As in other in-house building projects, a contract team comprising professionals of different disciplines in HD was responsible for all stages of work of the TC project, including planning and design, preparation of tender documents and contract administration. Since TC was a building contract, the Contract Team was headed by a chief architect who assumed the role of CM. A PSE was responsible for matters relating to structural aspects such as steel reinforcement and reported to a CSE. During the period relevant to the TC case, Mr LING Man-kwong was PSE/TC and Mr CHAN Siu-tack was CSE/TC.

The site staff

7.9 HD staff were responsible for site inspection in the TC project. During the project period, the site supervisory team comprised one COW (who concurrently looked after another project), one ACW and several WSs depending on the stages of construction. Mr HA Siu-wah was PCOW/TC from 7 October 1998 to 1 October 1999.

The Contractor's Team

7.10 The key employees of CKFC involved in the project in connection with steel reinforcement were Mr CHOW Che-wai, the Construction Manager, Mr LO Yue-hang, the Site Agent (SA/TC), and Mr CHAN Fung, the QCE (QCE/TC).

The Subcontractor

7.11 CKFC subcontracted steel fixing to Fu Tat Construction Co. Ltd. (Fu Tat) at a contract sum of over $16 million. Mr TAM Lan-po was the director of Fu Tat and claimed to have stationed at the site full time. Fu Tat employed about 30 workers to do the steel fixing work.

7.12 An organization chart showing the key personnel of HD, CKFC and Fu Tat for the TC project in respect of steel reinforcement is in **Appendix VII(2)**.

Construction

Requirements in the Specification

7.13 Clause 42 of the General Conditions of Contract provided that all materials must be of such character, quality and kind as required by the Contract and were to be subject to such examination and tests as the Contract required. According to the Specification on Reinforcement Materials, all steel reinforcement bars used in the project must comply with the Construction

Standard for Carbon Steel Bars for the Reinforcement of Concrete (CS2) issued by the HKSAR Government, which applied to all Government works. The procedures for the use of steel reinforcement bars were set out in the Contract as follows:

(a) test specimens of the bar reinforcement from each batch of the material delivered to site be provided in accordance with the sampling rate specified in CS2 (Specification CON 3.T110.1);

(b) test specimens of the specified size be selected at random at site by the CM (Specification CON 3.T120.1);

(c) each specimen of bar reinforcement be subject to the number of tests in accordance with CS2 by the Direct Testing Contractor employed by HA. According to HD, these tests included yield stress, mass per metre, tensile strength, elongation, bend and rebend (Specification CON 3. T120. 1 and CON 3.T210.1, Clauses 5.1.1, 5.1.2, 6.2 and Table 9 of CS2);

(d) sufficient time be allowed for the testing of specimens and steel reinforcement must not be used until the relevant test specimens had successfully passed all tests (Specification CON 3.T230.1);

(e) if any test specimen failed to meet the tensile strength, elongation, bend and rebend test requirements, two additional test specimens be taken from different bars of the same batch for re-test. According to HD, re-test did not apply to test specimens failing tests on yield stress and mass per metre (Specification CON 3.T410.1 and CS2 5.1.4); and

(f) a batch of bar reinforcement was deemed to comply with the Specification if the test results on specimens met the requirements of CS2. Any non-complying batch of bar reinforcement was to be removed from site (Specification CON 3.T310.1).

Inspection requirements in Housing Department manual

7.14 Engineering Site Inspection Manual (DEI) 806 set out the inspection procedures on reinforcement and steel fabric. HD site staff were the specified action officers for a number of checking procedures. Amongst other duties, HD site staff were required to:

(a) check that the mill certificates, weighing certificates and delivery receipts were relevant to the consignment of reinforcement and in compliance with the Specification. The mill certificates had to be certified by the supplier and the Contractor, and the weighing certificates and the delivery receipts had to be certified by the Contractor (Activity 1);

(b) check classification, patterns and diameter of bars against the mill certificates and the approximate quantity against the delivery receipts (Activities 2 and 5);

(c) arrange the cutting of samples from each consignment for testing in accordance with the Specification (Activity 6);

(d) identify locations of stockpiles for each consignment delivered (Activity 10); and

(e) record the running total for the quantity of reinforcement delivered. Any rejected or removed quantity had to be deducted from the running total (Activity 11 (xii)).

7.15 DEI-806(8) required the PSE to check the results of tests on specimens and take follow-up actions, if any, in accordance with the Specification.

Delivery of steel reinforcement bars to site

7.16 At the commencement of the Building Contract, CKFC submitted a site plan to the Contract Team of HD which showed the designated areas for storage, cutting and fixing of steel reinforcement bars delivered to site. There were altogether four steel yards to serve the four blocks, with the two larger ones located in-between two blocks and the two smaller ones in the Precast Facade Yard. All bars delivered to site were transported to a designated yard where the cutting and fixing of steel reinforcement bars took place. There was no segregation of steel reinforcement bars of different status. Bars pending test results, bars passing the tests and permissible for use and bars failing the tests and pending removal were placed together. A copy of the site plan showing the locations of the steel yards is in **Appendix VII(3)**.

7.17 When a batch of steel reinforcement bars was delivered to site, CKFC had to provide the mill certificate, stockist certificate, and weighing certificate to HD site staff for checking. A site plan showing the location of the batch of bars was also submitted by CKFC to PSE/TC for information.

7.18 The mill certificate certified by the steel bar manufacturer showed the result of quality control test on the batch of bars in question. The stockist certificate provided by the supplier set out the descriptions of the steel reinforcement bars by size, weight and bar pattern with reference to the mill certificate number. The weighing certificate provided by the supplier showed, among other things, the date and the time the truck departed from the godown transporting bars to site and the net weight of the bars in question.

7.19 For the purpose of identification, when a batch of steel reinforcement bars was delivered to site, a batch number was assigned to it and both ends of the bars were sprayed with a colour in accordance with a pre-arranged system of colours, except green and red. These two colours were reserved for differentiating the testing status of steel reinforcement bars: green

for pass and red for failure. The spraying of colours was done by the staff of the Contractor, i.e. CKFC. There was no requirement that the site staff of HD had to witness the spraying of colours.

7.20 The five batches of steel reinforcement bars, which are the focus of inquiry of the Select Committee, were delivered to site between January and May 1999 with the assigned numbers 23, 24, 26, 37 and 50. The five batches were checked by HD site staff concerned against the relevant certificates and found to be in order. A summary of the bar size, the quantity and the date of delivery to site of the five batches of steel reinforcement bars is in **Appendix VII(4)**.

Sample testing of steel reinforcement bars

7.21 In accordance with the Specification, test specimens of 600 mm or 20 times of the nominal bar diameter, whichever was the greater, were taken from each batch of the steel reinforcement bars for testing. Although Specification CON 3.T120.1 provided that test specimens be selected by the CM at site at random and DEI-804(6) required HD site staff to arrange the cutting of samples for testing, the Select Committee has obtained conflicting evidence on whether the test specimens were randomly selected by the HD site staff concerned. While PCOW/TC said that the HD site staff concerned had selected the bars for testing, Fu Tat and another witness said that it was not the case. The test specimens of 1.5 m long each were cut by the steel fixers under the supervision of CKFC staff and were submitted to HD site staff for delivery to Castco Testing Centre Limited (Castco), the testing contractor directly employed by HA, for testing.

7.22 The Select Committee notes from records that the test specimens were normally sent to Castco one or two days after delivery of the bars to site. However, for batch numbers 23 and 24, it had taken about a week before the test specimens were sent to the testing laboratory. The reason given by the witnesses was that the documents relevant to the two batches were incomplete when the bars were delivered to site. The test specimens could only be sent to the laboratory after CKFC had submitted all the relevant documents.

A summary of the delivery dates to site and to the laboratory in respect of the five batches of steel reinforcement bars is in **Appendix VII(5)**.

Notification of test results

7.23 According to the contract between HD and Castco, the test certificate showing the test result on specimens of steel reinforcement bars had to be issued to HD not later than nine days after receipt of the specimens by Castco. Castco provided two test reports: a preliminary report as soon as the testing had been carried out and a test certificate after a final internal checking by Castco. The preliminary report recorded the test result on specimens in handwriting, while the test certificate was in printed form.

7.24 HD's structural engineers told the Select Committee that to enable the Contractor to know the test result as soon as possible, an arrangement was made whereby Castco was required to notify in parallel the Contract Team and HD site office the result of the preliminary report by fax. The HD site office would then inform the Contractor verbally of the test result, followed by a site direction to the Contractor if the bar specimens failed the test. As the results of the preliminary report and the test certificate were rarely inconsistent, the Contractor was allowed to spray the bars with colour in accordance with the result of the preliminary report and use or remove the bars accordingly. However, in the event that the result of the test certificate was at variance with that of the preliminary report, the Contractor was obliged to take action on the reinforcement bars in accordance with the test results shown on the test certificate. The risk therefore rested with the Contractor. The Select Committee notes from records that the test certificate was normally issued by Castco to HD one or two days after the issue of the preliminary report. HD forwarded the preliminary report to the Contractor on the same day or within one or two days. Under the arrangement, the Contractor was able to use the bars before the formal receipt of the preliminary report.

7.25 The Select Committee notes from PCOW/TC that the number of site staff was far below the then prevailing manning ratio of HD. HD site staff concerned therefore did not witness the spraying of colour on bars by CKFC with reference to the preliminary result on every occasion. The site staff,

normally WSI/TC, would, about one in ten, inspect the bars after spraying by the Contractor to verify that they were marked with the right colour.

7.26 The five batches of steel reinforcement bars in question failed marginally on tests on either yield stress or mass per metre. PSE/TC informed PCOW/TC the result verbally who then passed the message to CKFC. Since the non-complying batches could not be re-tested in accordance with the Specification, PCOW/TC issued a site direction to CKFC informing the failure of the specimens in the sampling test. A summary of the dates of issue of the preliminary reports and test certificates by Castco to HD and of the dates when HD sent the preliminary test reports to CKFC in respect of the five batches of bars is in **Appendix VII(6)**.

Use of substandard bars in permanent structures

7.27 There is evidence that when CKFC was notified of the unsatisfactory test results of batches 23, 24 and 26 in February 1999, a substantial amount of the bars had already been used in the permanent structures. A witness claimed to have reported the use of substandard bars to the Construction Manager, who, however, denied that he had been informed.

7.28 The Select Committee has attempted to find out why the Contractor used bars pending test results. There is no clear evidence that there was a shortage of compliant bars at the site. In addition, any substandard bars could be returned to the supplier without any significant financial loss incurred on the part of the Contractor. Under the circumstances, there did not exist any obvious financial incentive for the Contractor to run the risk of using steel reinforcement bars pending test results. The Select Committee, however, notes that bars of different testing status were stored in the same place without segregation. Steel fixers might easily use bars that were readily available to them without regard to their testing status. According to a witness, he once attempted to stop the steel fixers from using the batch of bars not sprayed with green colour, but the steel fixers threatened to hit him. The Select Committee was told by another witness that Fu Tat might have further subcontracted the steel fixing work. It was not uncommon in the industry that the workers employed by a sub-subcontractor were paid on a daily rate irrespective of the

work done, whereas the subcontractor paid the sub-subcontractor on the basis of the actual work done. There might possibly be some financial incentive on the part of the sub-subcontractor to use bars available on site without regard to their testing status. However, the Select Committee could not find conclusive evidence on the issue, as Fu Tat denied that it had subcontracted the steel fixing work. Fu Tat told the Select Committee that its workers cut bars sprayed with green colour only. Evidence from HD suggests otherwise. On 2 February 1999 HD site staff found that steel fixers cut the bars of batches 24 and 25 before the test results were known, and a site direction was issued by PCOW/TC to the site agent of CKFC to that effect. This is clear evidence that the workers did not use only bars sprayed with green colour. Since the director of Fu Tat told the Select Committee that he was stationed at the site full time, there was no reason why he was not aware of this incident as he claimed.

Removal of non-complying steel reinforcement bars from site

7.29 According to a witness, when CKFC was notified of the failure of the test on batches 23, 24 and 26, a substantial part of the bars had already been used. The Select Committee was told that the retrieval of substandard bars was feasible by making reference to the site records and the bar pattern of the batches in question, although the process was mammoth and difficult. The Select Committee notes that this retrieval process did not take place. According to a witness, he was instructed by the Construction Manager to remove substandard bars which had not yet been used. In order to cover up the shortfall, some bars of other batches in stockpile were also removed. In doing so, it would give the false impression that all substandard bars had been removed from the site. CKFC then claimed that all the substandard bars had been removed. The Construction Manger, however, said that he had not participated in matters relating to the removal of the substandard bars from the site. The use of bars pending test results happened again for batches 37 and 50, the specimens of which also failed in the tests. The same witness told the Select Committee that as the amount used in respect of batch 50 was relatively small, CKFC simply removed from site the bars of the relevant batch which had not yet been used without making up the shortfall.

7.30 Records show that the five batches of non-complying bars were removed from site. Documents relevant to the removal were provided by QCE/TC to PSE/TC for record. These included photos showing a truck loaded with the non-complying bars, returned goods advice from the steel supplier showing the bar size, the quantity and the weight of the bars returned and Form BPP-F49 signed by PCOW/TC acknowledging the removal. The bar size, quantity and weight of the bars returned, as shown on the returned goods advice, matched the details of the batches concerned. The returned goods advice were found by the Court to be falsified documents.

7.31 The Select Committee has examined why the removal of bars other than the relevant batches was not detected by the HD site staff concerned. PCOW/TC explained to the Select Committee that the site staff could not tell the weight of bars returned by witnessing their removal. The non-complying bars would only be weighed upon their return to the supplier. As it was his duty to verify that the weight of non-complying bars removed from site was the same as that of the relevant batch delivered to site, PCOW/TC had checked the relevant documents and the photographs provided by the Contractor before signing on Form BPP-F49 acknowledging the removal. It was not possible for him or other HD site staff concerned to witness the entire removal process, as this would involve accompanying the truck driver all the way from the site to the supplier's godown. Indeed, there was no express requirement in DEI for site staff to witness the removal of non-complying steel reinforcement bars from site. DEI-806(11) only required PCOW to deduct any rejected steel reinforcement steel from the running total. The HD structural engineers concerned, whilst admitting that there was no stipulated guideline on inspecting the removal of non-complying bars from site, considered it a good practice to witness the removal process and expected the site staff to follow that practice. PCOW/TC told the Select Committee that in the absence of an express inspection requirement on removal procedure, the site staff followed the general practice of inspecting 10% of the removal of materials from site. The Select Committee finds that although records show that some bars were removed from site, they were either not entirely from the relevant batches or less than what was recorded.

Observations

7.32 It may be a relief to HD and members of the public that despite the use of substandard bars in this particular incident, the structural integrity of the buildings remained sound as confirmed by the independent investigation conducted by CMW. This, however, does not change the fact that those bars should not have been used. Steel reinforcement is a key element of building structure. The use of steel reinforcement bars not meeting the specified standard could have serious consequences. Had HD's monitoring system been effective, the use of untested bars might have been prevented.

7.33 The Select Committee notes that QCE/TC and the Construction Manager have been convicted of conspiracy to defraud, and the latter has lodged an appeal against both conviction and sentence. The Select Committee also notes the Construction Manager's claim to the Select Committee that he had no knowledge of the use of substandard bars on the site and did not participate in the removal of substandard bars from the site (see paragraphs 7.27 and 7.29). In view of the fact that the matter has been adjudicated by the Court and will be subject to further judicial proceedings, the Select Committee finds it inappropriate to come to any finding on these two points. However, despite the part played by criminality in this case, the Select Committee still thinks that the incident does reveal loopholes in a number of areas which must be addressed in order to prevent a recurrence.

Award of contract to the lowest tender

7.34 The senior management of HD repeatedly stressed that there was an incorrect notion that HA contracts were awarded to the lowest bidder, as HA also considered the technical competence and past performance of tenderers. The TC case, however, is an obvious example that tender price was the governing factor. The Contractor for the TC project, i.e. the lowest tenderer, had received as many as five adverse reports in respect of two ongoing projects in the 12 months immediately before the time when HD assessed the tenders, whereas the second and third lowest tenderers had received none during the same period. Nevertheless, HD still recommended to BC the award of the Contract to the lowest tenderer.

7.35 At the time when BC considered HD's recommendation to award the TC Contract to CKFC, CKFC had received two other adverse reports in respect of the two ongoing projects. The then BC Chairman told the Select Committee that BC had considered the nature of the seven adverse reports received by CKFC and was of the view that they should not constitute substantial grounds of objections against the award of the TC Contract. Moreover, CKFC had already been penalized by being restricted to hold not more than two New Works 2 projects at any one time as a result of those adverse reports. In his view, it was unfair that a contractor should be penalized twice for the same conduct.

7.36 The Select Committee is of the view that the consideration of adverse reports by BC should not deprive a contractor of the opportunity to be awarded a new contract. BC, however, has the obligation to give due regard to the past performance of a contractor when considering whether a works contract should be awarded. A performance record with seven adverse reports over a period of 13 months should not be taken lightly. The minutes of the BC meeting did not indicate that BC had examined in depth the seven adverse reports received by CKFC. What the minutes showed was HD's concern for progress of works. The minutes said:

> *"Despite the fact that CHEFKC [sic] had received seven reports, the Department would still recommend their tender be accepted because of their satisfactory performance in a recent NW2 contract in Tseung Kwan O. They completed the contract before the completion date and were able to expedite their works to bring the completion into the 1997/98 financial year."*

7.37 Progress and cost had consistently been the primary concern of HD in the development process. The Select Committee appreciates that tender price is a factor to be taken into account. However, the track records of tenderers in providing quality works should be an equal if not more important consideration when HD and BC examine the suitability of the tenderers for undertaking a project. Before awarding a contract to a tenderer with adverse reports, both HD and BC must be fully satisfied that the tenderer is capable of

providing quality work. In the TC case, there was no documentary evidence that HD and BC had taken adequate steps to satisfy themselves that CKFC was capable of delivering quality work in the light of the adverse reports. It appears that the award of the TC Contract to CKFC was for no other reason than its tender being the lowest. The incident also demonstrates that BC relied heavily on the advice of HD staff.

Areas for storage, cutting and fixing of steel

7.38 The arrangement made by the Contractor, with no objection from HD, to store bars of different testing status in the same place without segregation provided an opportunity for their indiscriminate use. The Select Committee recognizes that such a physical arrangement would facilitate the daily operation of workers, as they could cut and fix steel bars once the specimens were tested to have complied with the specified standards, hence saving the trouble of transferring the bars from the storage area to the working area upon notification of the test result. However, such a physical layout would require at the same time a high level of vigilance of both the Contractor and HD site staff concerned to prevent the use of bars pending test results, be it intentional or inadvertent. Should there be any desire to use bars before the test results were known on the part of the Contractor, the subcontractor, the sub-subcontractor or the workers, the way bars were placed in the TC case provided physical convenience. The Select Committee notes from a housing project undertaken by HS that the contractor concerned was required to segregate bars of different testing status. In the view of the Select Committee, it was unwise on the part of HD to have agreed to the layout plan of the Contractor in the TC project to store bars of different testing status in the same place.

Inspection requirements

7.39 As steel reinforcement is a key structural element of a building, the inspection procedures should be clearly laid down to enable the responsible staff to follow them closely. These procedures should be supplemented by guidelines or instructions where necessary. As evidence has revealed, in view of the large amount of various activities going on at a construction site at the

same time, site staff required to carry out the inspection procedures could only discharge their duties satisfactorily if the methods they adopted were adequate to prevent and identify malpractice. However, the Select Committee is surprised to note the absence of guidelines in the inspection procedures on spraying of colours on bars to reflect the testing status and on the removal of non-complying bars from site. It was also surprising to the Select Committee when the structural engineers said that they had expected good practice methods would be adopted by the site staff, such as to witness the removal of non-complying bars from site, on their own initiative, without the need for instructions or guidance. Such expectation, in the view of the Select Committee, may be unrealistic by reason of a shortage of site staff. Under these circumstances, the Select Committee does not find it surprising that the HD's site staff in the TC project seldom made a point of their attendance when the spraying of colours on bars or the removal of non-complying bars from site occurred, thus providing abundant opportunities for any contractor to tamper with the spraying of colours on bars or their removal.

Monitoring of materials

7.40 As in the SY case, loose control of materials in and out of site and on site is apparent in the TC case. In the first place, for the purpose of meeting the requirement in the Specification for removing non-complying bars from site, some bars in the stockpile on site were used to replace the non-complying bars which had already been used in the superstructure. This had gone unnoticed by HD site staff concerned. Further, to replenish the bars in the stockpile which had been removed, bars were delivered to site without being properly recorded as required in the manual. The bypassing of such recording procedure again went unnoticed by the HD site staff concerned. As pointed out in Chapter VI, the monitoring of materials by HD site staff depended on notification by the contractor. If a contractor chose not to report for whatever reason, there was no way for HD site staff to exercise any control over delivery of materials in or removal of them out of the site in the absence of an effective and practical material checking system. This was exactly what happened in this case, and the material involved, namely steel reinforcement bars, was an important structural element of a building.

Alertness of Housing Department staff to irregularity

7.41 The HD site staff concerned did observe on one occasion that the steel fixers were cutting bars pending test results in breach of the Specification. However, the incident failed to alert the site staff concerned and the Contract Team. No action was taken to raise their level of vigilance in monitoring the use of steel reinforcement bars. Although a site direction was issued by PCOW/TC to the Contractor reminding it not to cut bars before the test result was known, neither he nor the Contract Team followed it up to ensure that the bars in question would not be used before they passed the tests. It turned out that the same batch of bars (batch 24) was later found to have been used in permanent structures before the test results were known and the amount used was substantial. The TC case is another example to show that HD staff were not alert to possible malpractices in the work process.

Appointment of a quality control engineer for quality control

7.42 As in the YCK case, the TC case makes a mockery of the requirement in HD contracts for the appointment of a QCE by the contractor for the purpose of ensuring quality work on the part of the contractor. A QCE is expected to discharge his professional duties independently by adopting a critical attitude towards the standard of work executed by his employer. However, the YCK and TC incidents suggest that when a QCE is an employee of the contractor, he may not exercise the required level of vigilance in discharging his duties.

7.43 The QCE for the TC project had no previous experience as a QCE and did not have a clear understanding of the duties of a QCE. He told the Select Committee that he simply carried out the duties he was assigned, such as the signing of letters to the PSE to confirm the removal of the batches of bars failing the sampling tests even with the knowledge that this had not been the case. The Select Committee observes from the YCK and TC cases that the appointment of a QCE by a contractor is not an effective measure to ensure quality of work.

Concluding observation

7.44 The selection of a right contractor, the design of a proper mechanism for handling materials, the provision of adequate inspection procedures, the deployment of a competent QCE and a high level of alertness to irregularities on the part of supervisory staff are important elements for ensuring quality work. Unfortunately in the TC case, the Select Committee has found deficiencies in each of these areas.