

Shia Kian Eng (trading as Forest Contractors) v Nakano Singapore (Pte) Ltd
[2001] SGHC 68

Case Number : Suit 600245/2000
Decision Date : 03 April 2001
Tribunal/Court : High Court
Coram : Judith Prakash J
Counsel Name(s) : George Tan with Monica Neo (Chan Tan & Partners) for the plaintiff; Thio Ying Ying with Lim Kwee Huat and Cheong Aik Hock (Kelvin Chia Partnership) for the defendants
Parties : Shia Kian Eng (trading as Forest Contractors) — Nakano Singapore (Pte) Ltd

JUDGMENT:

Cur Adv Vult

Introduction

Background facts

1. The series of disputes involved in this action arises out of the construction of the development known as Woodsvale Executive Condominium at the junction of Woodlands Avenue 7 and Woodlands Drive 72. The development consists of a total of 13 high-rise apartment blocks. The developer Woodsvale Land Pte Ltd which appointed the defendants herein, Nakano Singapore (Pte) Ltd (Nakano), as their main contractor under a design and build contract. Nakano in turn appointed a number of sub-contractors to carry out different aspects of the works.
2. The plaintiff, Mr Shia Kian Eng, who carries on construction work under the trade name Forest Contractors, was one such sub-contractor. Hereafter, the plaintiff will be referred to as Mr Shia when personal reference to him is required but otherwise as far as business and contractual matters are concerned, the plaintiff will be referred to as Forest.
3. Forest was employed by Nakano to undertake various types of work at the project. These works included block wall construction, internal and external wall plastering works, skim coating works, tiling works, steel-lintel works, floor screeding works, solid brick wall works, the supply and installation of wire mesh above door frames and the supply of Smartplas Cement. The relationship between the parties started in July 1998 and ended, badly, in January 2000 when Nakano terminated Forests plastering works and ordered Forest off the site.
4. There are a number of disputes between the parties. Forest has sued for non-payment, under-payment and damages while Nakano has counter-sued for damages claiming that it was repudiation on the part of Forest that caused it to terminate Forests works before they were completed and, as a consequence, incur additional expenses to procure the completion of the works. In addition, Nakano claims that part of Forests works were defective and wants reimbursement of the rectification expenses.
5. In the statement of claim, Forest asked for \$2,794,744.61 in payment for the work it had done (both pursuant to the original contracts and pursuant to variation orders) up to the date of termination by Nakano. This amount was reduced to \$2,041,632.63 as a result of discussions both before and during the course of the trial. In addition to this amount, Forest claims damages for wrongful repudiation and interest on late payment of its invoices. Nakano contends that Forests claims are inflated and incorrect and, in any event, it is entitled to set off against Forests claim, its own counterclaim amounting to \$2,770,935.44.
6. Among the issues to be determined in this action are the following:

- (1) what documents evidenced the contracts between the parties;

(2) the amount due to Forest for the unpaid balance of work done up to the date of termination which depends on the determination of the following sub-issues:

- (a) whether Forest is entitled to be paid additional amounts for extra thick plaster application on the external walls;
- (b) whether Forest is entitled to be paid extra for hacking the concrete surface to form keys;
- (c) the amount due to Forest in respect of the finishing of the entrance canopies;
- (d) whether any amount is due in respect of grouting around door frames;
- (e) whether Forest is entitled to recover the costs of rectifying debonded plaster;
- (f) whether Forest filled in the gaps between lift door jams and the concrete lift shaft at block 19;
- (g) whether Forest had to apply over-thick plaster to the internal block walls and, if so, whether payment for the same is due;
- (h) whether plastering of separation walls was included in the original scope of work or was a variation;

(3) the amount of previous payments made by Nakano;

(4) whether Nakano terminated Forests contract wrongfully;

(5) if the answer to (4) is in the affirmative, then the issue of damages for wrongful termination would have to be considered;

(6) if the answer to (4) is in the negative, then the issue of damages recoverable by Nakano would have to be considered and this would include consideration of whether it acted reasonably in mitigating its loss by employing a company called Acolite to do part of the rectification work for the defective plaster works and also the area of wall left unplastered at the time that Forest stopped work.

(7) whether, in any event, Forest was in breach of contract in relation to the works and what, if any, damages are payable to Nakano in relation to such breaches.

List of witnesses and important persons and companies referred to in the case

7. For ease of reference, I set out names and descriptions of persons who may be referred to in this judgment:

(a) Acolite: Acolite Construction (S) Pte Ltd, a company employed by Nakano to rectify defects in the plaster by using the pin-injection method;

(b) BBR: BBR Construction Systems Pte Ltd, the sub-contractor who put up the concrete frame of the blocks using a mechanical form work called the Doka system;

(c) the defendants witnesses:

(i) Satoshi Hattori, a general manager in Nakanos construction department who acted as the project general manager for this project;

(ii) Ling Hea Inn, Nakanos project manager in charge of finishing work at the project;

(iii) Steven Lee Tiong Chye, a foreman in Nakanos employ;

(iv) Nick Koan Ping Seng, a Nakano foreman;

(v) Jonathan Liow Thian Seck, a Nakano foreman;

(vi) Teh Teik Seng, a project engineer and site foreman employed by Nakano;

(vii) Phyllis Leong Yien Min, an assistant project manager employed by Nakano;

(viii) Quek Leng Keng, a mechanical and electrical co-ordinator employed by Nakano;

(ix) Yamazaki Tatsuaki, a director of Acolite;

(x) Law Kong Hoi, a professional engineer employed by Insight Adjusters and Surveyors Pte Ltd;

(xi) Wong Chung Wan (CW Wong), a civil and structural engineer who is manager of SETSCO Services Pte Ltd; and

(xii) Wong Siew Fai (CF Wong), a professional quantity surveyor working for Barton Associates Pte Ltd;

(d) the plaintiffs witnesses:

(i) Shia Kian Eng;

(ii) Koon Tack Meng, a site supervisor employed by Forest;

(iii) Kumaravalu A/L N Doraisamy (Kumar), a Forest site supervisor;

(iv) Kenneth Hugh Jones, a chartered builder and a director of Robinson Jones Associates Pte Ltd, a firm of building surveyors; and

(v) Michael Choo Swee Leng, a project director employed by Forest;

(e) Ian McGunnigle, a chartered building surveyor who was engaged by Nakano to examine a report presented by SETSCO Services and who filed an affidavit of evidence-in-chief but who was not called by Nakano; and

(f) Yu Bee: Yu Bee Construction, a firm carrying on the business of plasterers in Singapore.

Issues relating to Forests claim

1. What form did the various sub-contracts between Nakano and Forest take?

8. Forest and Nakano agree that there was no single sub-contract which covered the works to be carried out by Forest in relation to the project. They differ, however, as to the form which the various sub-contracts took. Forests position is that these were made partly orally, partly in writing and partly by conduct. Further, during the course of various sub-contract works, Forest had, pursuant to either written or oral requests from Nakano, carried out additional and variation works. With reference to the Purchase Orders which Nakano issued, Mr Shia does not deny signing these Purchase Orders on behalf of Forest. His stand is that these documents were issued purely for accounting purposes and for processing payments to Forest. The conditions endorsed on the Purchase Orders were not intended to be, and were not, incorporated as terms of the sub-contracts.

9. Nakanos position is that the sub-contracts are wholly in writing and that they comprise the Purchase Orders issued by Nakano and the various other documents mentioned in those Purchase Orders. These additional documents varied depending on the sub-contract concerned. All the Purchase Orders referred to the relevant quotation submitted by Forest. In addition, almost all referred to a document entitled Conditions of Sub-Contract and many referred to an Undertaking on Hiring of Foreign Workers. The Purchase Order which has caused the most dispute relates to the contract for block wall and external wall plastering and that referred, in addition to the documents just mentioned, to a document entitled Conditions of Purchase, to one entitled Bills of Quantity/Schedule of Rates and to Drawings.

10. The Purchase Orders take a standard form. Each of them has a ten digit identifying number. The first three digits of the identifying numbers of the Purchase Orders in question were all 800 and the court was informed that these digits were used to indicate Purchase Orders issued in the 1998 financial year whereas Purchase Orders issued in the following financial year bore the identifying digits 900. The first sentence of the first paragraph of each Order reads:

We are pleased to issue purchase order to you for the undermentioned works subject to the following Term and Conditions:

That sentence is followed by various items including a description of the scope of work, the contract price, the maintenance period, the dates of commencement and completion and the item payment terms which in each case was described as being 30 days. The second paragraph of each Purchase Order starts:

Subject also to the following documents as annexed herewith which form an integral part of this contract:

(a) Conditions of Sub-Contract ...

and thereafter there are further sub-paragraphs mentioning other documents including the relevant quotation submitted by Forest. The last sentence of the Purchase Order is in bold capital letters and states:

PLEASE SIGN AND RETURN DUPLICATE COPY TO THIS OFFICE EARLY SO AS TO AVOID DELAYED PAYMENT

11. It is not in dispute that none of the Purchase Orders were issued before Forest started work on any of the sub-contracts. Mr Shia testified that the sub-contracts arose out of negotiations between himself, Mr Hattori and Mr Ling based on the scope of work to be done and quotations that he had given to Nakano in June and July 1998. Also Forest had been requested to do mock-ups of the plastering works and, after these mock-ups were found to be acceptable, Forest had been instructed to start work by Nakanos representatives. The Purchase Orders were, according to Mr Shia, nowhere in evidence at the time of these discussions or when he started work. They were only given to him subsequently when he asked how payment was to be made. He was then told that the Purchase Orders had to be signed in order for him to receive payment. He therefore signed the documents purely for Nakanos administrative purposes.

12. Nakano submitted that the Purchase Orders were sent to Forest on varying dates and that Mr Shia had ample opportunity to raise any objections he had to their terms. Mr Shia, however, did not raise any such objection. He signed all the Purchase Orders without seeking to vary any of the terms and conditions. As he did not indicate that he was unhappy with the terms or could not agree to any of them, Nakano had no reason to believe that Forest did not consider itself bound by the terms of the Purchase Orders and the terms and conditions of sub-contract attached to them. When Mr Shia returned the signed Purchase Orders, it was reasonable for Nakano to assume that he had accepted their terms.

13. Nakano submitted that by attempting to adduce oral evidence to contradict the written terms and conditions set out in the Purchase Orders, Forest had fallen foul of the parol evidence rule. I cannot accept this submission. Whilst once it is clear that a contract has been made wholly in writing, parol evidence is not admissible to add to, vary, subtract from or contradict the written terms, that rule does not apply when the issue to be determined is whether the contract is wholly in writing or not. In such a case, the court is entitled to receive evidence whether parol or otherwise of all the relevant circumstances in order to determine what sort of contract came into existence.

14. Forests stand is that as an acceptance of an offer can be made by conduct, in this case the sub-contracts had been constituted by Forests commencement of work on Nakanos instructions and the only written documents that formed part of the sub-contracts were its amended quotations. In order to combat this submission, Nakano further submitted that even though the Purchase Orders were issued and signed after works had commenced, the conditions of sub-contract attached to them formed part of these sub-contracts and had a retrospective effect so as to make the conditions apply to things done earlier in anticipation of the conclusion of formal documentation. It relied on *Trollope & Colls Ltd. v Atomic Power Construction Ltd* [1962] 3 All ER 1035 which held that there was no principle of English law which provided that a contract could not, in any circumstances, have retrospective effect. In that case the defendants carried out civil engineering works for the building owner at the request of the plaintiff at a time when the parties were still negotiating alterations to the tender. Parties only agreed on the form of general conditions of contract ten months after the defendants started work. The Court held that the conditions of contract were binding on the parties on the basis that they had been conducting their transactions with one another for many months on the assumption that the contract would ultimately be agreed on lines known to both the parties although the final form of various terms of the proposed contract were still under discussion. In that case the parties had assumed that when the contract was made, ie when all the terms had been agreed in their final form, the contract would apply retrospectively to the preceding transactions.

15. In this case, it is not quite so clear that both parties had been in active negotiation on the form of terms and conditions and had started work on the assumption that these would eventually be agreed. The evidence given by Mr Shia was that his negotiations with Nakano related mainly to the type of work to be done and to the rates chargeable by Forest. Although Mr Hattori asserted in his affidavit that he had told Mr Shia during one of these meetings that the final contract would be subject to

Nakanos standard terms and conditions, there was no evidence that, at any time prior to asking Forest to start work on the external plastering, Nakano had furnished Forest with copies of its standard purchase orders and conditions of sub-contract. Even Mr Hattori did not go so far as to assert that any of the wording of the conditions in the standard terms and conditions was discussed with Forest. Further, whilst Forest started external plastering work in July, the Purchase Order for that sub-contract was dated 12 August 1998 and signed by Mr Shia on 10 September 1998. Mr Shia in fact asserted that he did not receive it in August 1998 and that it had been back-dated. He did not object to this, however, as he was anxious to receive payment and therefore concentrated on signing and returning the document as quickly as possible.

16. It is difficult to accept Nakanos contention that Forests quotations were accepted on the understanding that formal contracts would follow. Nakano had confirmed that it was familiar with the practice in the construction industry of using letters of intent that would usually contain a provision indicating that a formal contract would follow. It conceded that it had not issued any letter of intent in connection with this contract. As pointed out earlier, nor did its representatives give Forest a copy of its conditions of sub-contract for the latters consideration. Whilst Forest probably would have expected a written acceptance of its quotations it would not have expected to be inundated with contractual documents when it had not been given any such documents prior to commencing work. This would definitely be the case for those quotations tendered and accepted before 10 September 1998 when Mr Shia signed the Purchase Order for the block and external plastering works. Nakano could perhaps have argued in respect of the sub-contracts concluded after 10 September 1998 (by which I mean those in respect of which quotations were tendered and work started after that date) that they were made on the basis of all the terms of the relevant Purchase Orders including the conditions of sub-contract since after that date Forest would have been aware that Nakano did have standard conditions of sub-contract that it wanted to apply to all its sub-contracts. Nakano has not, however, made any submission that distinguishes the position in relation to the later sub-contracts. This may be because it is mainly in relation to the sub-contract for the external plastering works that Nakano is anxious to persuade the court that the Purchase Order and its attachments formed the entire contract. The issue is not as important for the other sub-contracts. In any case since no such submission has been made, I must treat all the sub-contracts as having been concluded on the same basis.

17. In my judgment, the sub-contracts were, as contended by Forest, partly in writing and partly oral. The written portions of the sub-contracts comprised the quotations and the original Purchase Orders which Forest signed after commencing the work. It is significant that, as Nakano pointed out, Mr Shia did not object to any of the terms relating to the works that appeared on the face of the Purchase Orders. These were the items that had to be agreed in order for a contract to exist and it is likely that the reason he did not object to them was that these terms reflected the prior discussions.

18. The above holding, however, does not mean that Forest had agreed to accept as part of the contract all the documents that were annexed to the Purchase Orders or that the same were incorporated in the contract simply by being mentioned in the Purchase Orders. I have already mentioned the difficulties with incorporating the conditions of sub-contract. As regards other documents, it should be noted that while the Purchase Orders mentioned these various documents as being annexed to them, not all the documents were in fact so annexed. For example, in the Purchase Order relating to the external plastering works, among the documents stated as being annexed were Specification and Drawings. It appears from Mr Lings evidence that these documents were not in fact annexed. In his affidavit after listing the documents that had been forwarded under cover of the Purchase Order, he stated that the drawings had already been shown to Mr Shia and the specifications were the ones which had been furnished to Nakano by one Mark Tung. It is difficult to incorporate as part of a contract documents which are not furnished (and not simply shown) by one party to the other either prior to or at the time of signing of the contract unless there is clear indication by that other party that he would accept documents subsequently given as part of the contract. This did not happen in this case.

19. As regards the plastering contract, Nakanos position is that the manufacturers brochure for the use of the proprietary cement product called Smartplas was incorporated as part of the sub-contract by the reference in the relevant Purchase Order to Specification in para 2(d) thereof. This brochure was sent to Nakano by the aforementioned Mark Tung, the vendors representative. The brochure was not supplied by Forest nor was there any evidence that Forest had seen the same brochure that had been given to Nakano.

20. Forest did not accept that the product brochure was incorporated as part of the plastering sub-contract by mention of the

word Specification in the Purchase Order. Forest did accept that the brochure contained technical information but this in itself did not, Forest submitted, mean that the word Specification referred to that brochure. In fact there was a great deal of doubt over the precise meaning of the term as used in the Purchase Order.

21. First, the persons in Nakanos quantity surveying department who prepared the Purchase Orders had not seen, and would not know of the existence of, this Smartplas brochure. They were not even aware that Smartplas was the product being used. Further, Nakano gave no evidence as to who gave the Purchase Orders to Mr Shia to sign and what he was told about documents at that time. Mr Shia identified Ms Phyllis Leong as the person who handed the Purchase Orders to him but Ms Leong herself gave no evidence on the circumstances surrounding the preparation of the Purchase Orders or their submission to Mr Shia. So there was no evidence that when he received the Purchase Order Mr Shia was informed that the Specification mentioned in that document referred to the Smartplas brochure or that the brochure was attached to the Purchase Order. Mr Hattori in his oral evidence also appeared to agree that the brochure had not accompanied the Purchase Order.

22. That there was doubt as to what the word Specification meant was also evident from the oral testimony of Mr Ling. He conceded that that word may have meant either item 18 of the specifications in the main contract dealing with plaster work or secondly, a separate set of specifications that Nakano might have intended to specially prepare for the work to be carried out by Forest.

23. In view of the confused position relating to the project brochure, I am not able to hold that it was incorporated as part of the plastering sub-contract between Forest and Nakano. This does not mean, however, that the contents of the brochure are entirely irrelevant to this case. Since the brochure contained information about the use of Smartplas, it might be relevant in considering whether Forests workers applied the product properly. It is not relevant, however, for the purpose of considering what Forests contractual obligations consisted of.

2. What is due to Forest in respect of work completed before termination?

24. There is no dispute that Forest is entitled, in principle, to be paid for the work that it had done prior to the termination of the contract. What is at issue is exactly how much is due to Forest. The parties have agreed on some items but there are still substantial disputes in this regard.

25. Forests original claim was for \$2,794,744.61. Due to agreements before and during the trial, by the time of submissions, Forests claim was reduced to \$2,041,632.63 (excluding GST). This sum comprised the unpaid balance for all the original works and variation works carried out by Forest up to the date of termination. Forest derived this amount in the following manner:

	(S\$)	(S\$)
(a) Agreed value of original sub-contract works	5,100,896.76	
(b) Agreed/Undisputed variation	34,501.40	
(c) Disputed variation	1,309,020.55	
Sub-total:		6,444,418.71

(d) Less: Previous payment

4,402,786.08

Balance:

2,041,632.63

26. It would be noted at once that the parties had agreed on the value of the original sub-contract works performed by Forest. The dispute over Forests payment entitlement is largely centred on the variation works that Forest claims to have effected. Its original claim for variation works was for \$1,777,669.04. Due to agreements arrived at, the total sum now claimed for variation works is \$1,343,521.95. As shown in the table above, of this sum \$1,309,020.55 is disputed by Nakano. There are eight items which make up this claim. I will deal with them separately.

2.1 Extra over-thickness for external plastering

27. In the original quotation for external plastering, Forest quoted a rate of \$14 per square metre for plastering the internal walls and a rate of \$15.50 per square metre for plastering the external walls. After discussion with Nakano, these rates were revised and the subsequent quotation issued read, in relation to these items:

Plaster Internal Wall (8mm. plaster with skim coat) S\$10.50/m

- External Wall (10mm. plaster without skim coat) S\$12.50/m

In each case, the words in parenthesis describing the thickness of plaster required had not appeared in the original quotation.

28. Forests case is that in respect of the external walls, it was contractually obliged to apply plaster only to a thickness of 10 mm. Its price of \$12.50 per square metre was based on this thickness of plaster being all that was needed for the external walls. The claim for over-thickness is founded on the assertion that in order to provide a smooth and vertical surface over an uneven concrete substrate, Forest found that it had to apply plaster that had a thickness greater than 10 mm. As a result, it incurred extra costs that it contends it should be compensated for.

29. Forest pointed out that originally Nakano had intended only to apply a skim coat over the concrete substrate, not to apply plaster. As it turned out, however, Nakano was not able to achieve the smooth surfaces it had expected and therefore, as Mr Hattori agreed, it eventually decided to use plaster to cover the uneven surfaces. Forest was not, however, informed that this was the purpose of the plastering sub-contract.

30. Prior to the application of the plaster, Forest was required to put in place corner beads and level pegs. A mock-up was conducted to observe and approve its sequence of work and representatives of Nakano and the developer were present to inspect the work carried out at the mock-up. The application of the plaster according to the alignment marked out and delineated by the corner beads and level pegs was intended to ensure that the plastering work was sufficiently flat and smooth. In short, Forest submitted, the walls were not meant to remain uneven after plastering. In the course of applying the plaster, however, it became clear that it was not possible to achieve the flat and smooth plastered surface by applying only 10 mm of plaster owing to the non-verticality of the concrete walls and the introduction of groove lines.

31. Forest pointed out that verticality reports prepared by Nakano itself indicated that the concrete walls were not vertical and had indentations and protrusions. During cross-examination, Mr Hattori conceded to deviations of up to 20 mm. Further, in some locations, the reports seem to show that there were deviations of up to 32 mm.

32. In August 1998, Mr Shia approached Mr Ling at the site office and informed him that the concrete walls were not vertical. At that time most of the blocks were roughly about four storeys high. Nakano did not take Mr Shias comments very seriously. It considered that they were a method of trying to obtain an increased rate for the external plastering. Mr Shia repeated his observation of the non-verticality of the walls in a letter of 16 November 1998. This stated that as a result Forest had had to lay plaster of a minimum thickness of 15 mm and, in many cases, had laid plaster of 45 mm thickness. It put the average thickness of the plaster laid to that date as 25 mm and quoted a rate of \$22.50 per square metre for the total thickness of plaster laid (ie the original rate of \$12.50 per square metre for the contracted thickness of 10 mm plus an additional \$10 per square metre for the over-thickness). Forest asked Nakano to issue it with a formal variation and confirmation of the new rate. As this letter was not responded to, a reminder was sent a month later. That was ignored too.

33. Forest submitted that Nakano should and could have made further investigations based on what Forest had told it. It further submitted that this was not done because Nakano had decided that the application of over-thick plaster was a solution to deviations in verticality. Counsel pointed to a letter that Nakano had written to BBR in September 1999 complaining about a slanting wall which BBR had not rectified and stating that Nakano would carry out rectification works by getting its plastering contractor to thicken the wall. When shown this letter, Mr Hattori agreed that he had decided by September 1999 that the solution to deviations in verticality was to apply extra-thick plaster. He also conceded that it was more expensive to rectify concrete structures directly than to cover the unevenness with plaster. Mr Hattori maintained, however, that the concrete structure needed to be rectified only when the deviation was out of the tolerance and that in this case there had been no verticality problems.

34. Nakano takes the position that Forests claim for the application of over-thick plaster is a fictitious one. It pointed out that Forest had not produced any records of the thickness of plaster that was applied to the external walls. Nakano therefore submitted that there was no evidence that Forest had in fact plastered an average thickness of 25 mm throughout the entire expanse of all the external walls or that such thickness was necessitated by the alleged non-verticality of the walls. Nakano relied on the report that Mr CW Wong of SETSCO had prepared. This gave an analysis of samples of plaster which had been extracted from the reinforced concrete walls at different locations at the first storey level. According to the report, these samples showed that the overall thickness of the plaster fluctuated widely from 8 mm to 28 mm. The number of layers also varied: there were between one and three layers. Nakano used this observation to submit that Forests claim that it had plastered three coats throughout the external walls was untrue. It should be noted, however, that SETSCO took only seven samples from the external walls. In view of the wide expanse covered by the external walls (the parties agreed that Forests work covered 59,257.50 square metres of external wall), seven samples do not seem to me to be a sufficient number for one to infer that the samples are, in relation to thickness, representative of the total work carried out. Further, these samples were taken from the lowest level where the deviations in verticality, if any, would have been the least. No samples were taken from the higher levels where deviations in verticality would have increased.

35. Nakano also relied on readings of plaster thickness taken by Insight Surveyors for each level of several blocks chosen at random. From these readings, it appeared that Forest did not start with a minimum of 10 mm of plaster but started with 14 mm at the highest point. Nakano submitted that this made it clear that the over-thickness applied by Forest was more the result of poor supervision and workmanship than done to address any alleged verticality problem. Nakanos position was that 10 mm was an average requirement rather than a fixed requirement and that if Forest had started at 5 mm at the highest point it would only have had to plaster an average of 10.7 mm as demonstrated by the readings of one of the elevations of block 17. In the alternative, Nakano submitted that if the court held that 10 mm was a fixed requirement, then the average thickness of the plaster would have been 15.7 mm.

36. The results of the survey made by Insight Surveyors were exhibited in evidence. The survey covered one entire elevation of each of the 14 storeys of three of the blocks of the project and two entire elevations of a fourth block. This was a better sampling than that carried out by SETSCO. It showed that the thickness of plaster applied at block 17 varied between 14 mm and 20 mm. The average thickness of the plaster was 19.7 mm. For block 15, the thickness of plaster varied between 11 mm and 20 mm giving an average thickness of 14.4 mm. For block 9C, the thickness of the plaster varied between 14 mm and 24 mm giving an average thickness of 18.2 mm. For block 9C, the thickness of plaster laid varied between 15 mm and 24 mm giving an average of 19.5 mm in thickness.

37. I accept the submission made by Forest that they were required by the sub-contract to plaster a fixed quantity of 10 mm of plaster over the external walls. This appears to me to be the plain reading of the sub-contract. The depth of the plaster required was specifically added to the original quotation. It was also specified that this depth had to be achieved without skim coat thus indicating that it was a specific depth that was wanted. If it had been intended, as Nakano submitted, that this depth was to be an average depth, the word average would have been inserted in the quotation. I also accept the evidence of Forest that due to unevenness and variations in verticality the actual thickness of plaster applied exceeded the fixed quantity. This evidence was supported by the verticality surveys carried out by Nakano itself and also by the survey of Insight Surveyors. Mr Hattori made much of the fact that Forest did not start with the alleged minimum plaster thickness of 10 mm at the highest point and also put forward an alternative method of plastering. His method was effectively discredited during cross-examination.

38. I accept that due to variations in the verticality of the external walls and their unevenness Forest had to apply more than 10 mm of plaster to the walls in order to achieve an even and vertical effect. The difficulty that arises is in determining exactly how much extra plaster was applied. Forests claim is based on an average thickness of 25 mm of plaster being applied but this figure is not derived from records kept during the plastering work. There is no full survey of the thickness of plaster applied to all the elevations of all 13 blocks. Insight Surveyors report, dealing with four full elevations taken from three blocks, showed an average thickness per elevation of 19.7 mm, 14.4 mm, 18.2 mm and 19.5 mm respectively.

39. Forest derived its figures for the amount of plaster applied by calculations based on the amount of Smartplas cement premix that it had purchased and had delivered to the site for the purpose of the plastering works. Mr SF Wong, a professional quantity surveyor himself, agreed that a quantity surveyor can calculate a total quantity of premix required for a particular job if he knows what the material volume yield is. In this case, the volume yield of Smartplas, as obtained from the manufacturers brochure, was 0.6m per metric ton. Using this figure, Mr Jones, Forests expert, computed the total volume of internal wall plastering that was applied by multiplying the total quantity in metric tons by the yield per metric ton. In respect of the external walls, similar calculations were carried out by Forests quantity surveyor, Mr Manolo (who did not give evidence), and verified by Mr Choo. The calculations as such were not discredited by cross-examination. The issue that remains is whether I should rely on such calculations rather than on physical measurements. I see no good reason not to accept the calculations since the quantity of plaster purchased was not challenged and the method of making the calculations was a valid one. There was a point raised in court regarding possible wastage of the plaster during use but I accept Forests submission that this wastage would have been diminis. Certainly no evidence was adduced by Nakano to establish widespread wastage of plaster exceeding the 10% allowance for wastage already included in the calculations.

40. Accepting that 25 mm of plaster, instead of the contracted 10 mm, was applied to the external walls, the next issue is at what rate Forest should be paid for the additional 15 mm of plaster. It has claimed \$10 per square metre on the basis that its total cost for all 25 mm (including a profit element of 10%) was \$22.50 and thus the cost of the extra 15 mm after deducting the original price of \$12.50 per square metre was \$10 per square metre.

41. Mr SF Wong suggested an alternative rate of \$8.75 per square metre for the extra 15 mm of plaster applied. This was based on a calculation that to apply 25 mm of plaster would cost \$21.25 per square metre if three layers of plaster were applied. If two layers of plaster were applied then the cost would be \$16.25 per square metre. In either case, Mr Wongs calculation did not include any figure for profit on the work. As Forest submitted, it would be entitled to a profit element as part of its rate. It should also be noted that during cross-examination Mr Wong accepted that two coats of plaster on top of the base coat would have to be applied in order to bring the thickness up to 25 mm. Thus, the material rate suggested by him would be \$21.25 per square metre and not \$16.25 per square metre. If a profit element of 10% is added to \$21.25, the total rate would be \$23.375 which would be more than Forests claimed rate of \$22.50 per square metre. Accordingly I accept Forests rate of \$10 per square metre for the extra 15 mm of plaster.

42. The next question is to what area this rate should be applied. In the course of proceedings, the parties agreed that the area of external walls worked on by Forest was 59,257.50. They also agreed that Forest had worked on 5,551 square metres of walls in the lift lobbies. The issue here is whether the lift lobby walls should be considered as part of the external walls for the purpose of this rate or whether they should be considered as part of the internal walls to which a lower rate was applicable. The submission made by Nakano was that Forest had carried out plastering and skim coating on the lift lobby walls and this activity

was consistent with classifying those walls as internal walls as, under the internal plastering sub-contract, skim coating was required for internal walls. Further, since these walls were not exposed to the weather, they should be classified as internal walls rather than external walls.

43. Forest did not answer the above submissions. It appears to me that Nakanos argument is correct and since the lift lobby walls have little exposure to the weather, they should be treated as internal walls. Further, there was no evidence on non-verticality of lift walls which would have required correction by an application of thicker plaster. There is no need, therefore, to include the area of the lift lobby walls as part of the area for which Forest should be paid for the application of extra thick plaster.

44. Accordingly, the amount to be paid to Forest for the extra thickness of plaster applied to the external walls should be \$10 x 59,257.50 ie \$592,575. I award this sum to Forest. It is payable in full and without any deduction for retention.

2.2 Hacking to form keys

45. Forest claimed \$17,118.86 for hacking the concrete surface of the external walls to form keys to assist in adhesion of the plaster to the substrate. Nakano disputed this claim on the basis that it was part of Forests duty to do all that was necessary to ensure good plastering workmanship and that since the sub-contract for the plastering works was a supply and install contract, and as Forest claimed to be specialist plasterers, Nakano left it entirely to Forest to carry out whatever preparation the latter deemed appropriate to ensure good workmanship. Any hacking which Forest did, therefore, formed part of its plastering costs and could not be charged for separately.

46. Forest argued that preparation of surfaces and actual plaster works were two distinct items of work. This was reflected in the main contract between Nakano and the developer in that the preparation of surfaces appeared under item 11 whilst the plaster works appeared separately as item 18. Further, item 11 specifically made it Nakanos obligation to hack off projecting fins on the concrete work, to clean the concrete surface of dirt and incompatible materials and to thoroughly hack surfaces to form a key. The first two of the foregoing were not sub-contracted to Forest but carried out by Nakano itself or through BBR. As Mr Hattori acknowledged in court, item 18 dealing with plaster works said nothing about the formation of keys or the provision of a bonding agent.

47. Mr Hattori tried to avoid the implications of the separate categorisation by stating that the main contract specifications with regards to plastering work were only relevant if conventional cement/sand plaster was used. Whilst it is true that the main contract envisaged conventional cement/sand plaster being applied, this does not mean that simply because a different plastering material is used hacking need not be separately specified if it is to be carried out by the plasterer since, in any case, hacking does not appear as part of the item relating to plastering. Secondly, Forests contract was to supply and install not to design and build unlike the contract Nakano had. Although Forest suggested the premix material, the decision whether it should be used or not lay with Nakano and Nakano had therefore the obligation to determine what sort of surface was required for such material and who should provide the necessary surface.

48. Forest submitted that hacking to form keys or the application of a bonding agent were components of work that must, as matter of practice, be clearly specified. It relied on Rule 15.04(b) of Standard Method of Measurement of Building Works (SMM Rules) which states that any special treatment of a base (for example hacking, applying bonding agent) and the nature of the surface finish should be given in each description or in the relevant sub-heading for the work.

49. In this case, none of the sub-contract documents made express mention of any requirement to form keys or provide a bonding agent. Nakanos position was that since Forest had proposed the use of Smartplas, it had a duty to consider the specifications of that material and to carry out such surface preparation as was stipulated to be necessary by those specifications. In relation to this argument, as I have stated above, the ultimate decision as to whether Smartplas should be used lay with Nakano. Nakano had overall design responsibility and therefore had to consider how Smartplas would work in conjunction with the structural conditions found on site. It would therefore be up to Nakano to determine whether hacking was required for Smartplas and, if so,

to so specify in its contract with Forest. It would be noted also that according to the product information on the Smartplas brochure, that material only required a bonding agent or hacking to form keys if the thickness of plaster to be applied exceeded 12 mm. In this case, the specified thickness was 10 mm and therefore even if it was Forests obligation to consider hacking, Forest would not originally have concluded that hacking was required.

50. In my opinion, hacking was not included as part of the sub-contract. When Nakano requested Forest to hack the concrete surface, it was issuing a variation instruction and would therefore have to pay for the additional work done. Forests claim for this work amounts to \$17,118.86. Nakano submitted that the claim was inflated and should only amount to \$8,473.80 arrived at by using a rate of \$0.99 per square metre. This rate was calculated using the same formula as Forest did but replacing the skilled workers rate of \$10 per hour with the general workers rate of \$4.50 per hour plus 10% for profit. I accept this submission. Forest did not explain why skilled labour had to be used for hacking. I therefore award Forest \$8,473.80 for its hacking work.

2.3 Finishing of entrance canopy

51. Forest originally claimed that it had finished nine entrance canopies and was entitled to be paid for this work as a variation. Nakano did not dispute that this was variation work. It only disputed the number done. Forest subsequently conceded that it had done only six canopies, as asserted by Nakano but continued to assert that it was entitled to more money than Nakano was prepared to offer because it had not only plastered these canopies but had also laid block walls, including corner beads and wire mesh, to the faade beam and walls of the entrance canopies. Forest submitted that the rate for this item of variation work should not be based on the external plastering work rate of \$12.50 per square metre (which would mean that it would receive a total of \$5,318.25) but that it should be paid \$2,970.48 for each canopy based on the materials supplied and the labour charges involved.

52. Nakano submitted that Forests claim of \$2,970.48 per canopy was wholly arbitrary since its original claim was \$5,000 per canopy. Further it had claimed the same amount for each canopy even though these were of different sizes. Additionally, most of the work involved plastering and, even if the rate was doubled, the claim should not exceed \$10,700.

53. There was no evidence that the canopies were of different sizes. Mr Michael Choo gave evidence as to how the cost of \$2,970.48 per canopy is arrived at. This was not challenged by Nakano in cross-examination. It is also true that Nakanos calculation did not provide for the cost of materials. There was no evidence to contradict Forests assertion that each canopy required 24 man days of labour. This component accounted for most of the cost of construction. Accordingly, I award Forest its full claim of \$2,970.48 per canopy making a total of \$17,822.88.

2.4 Grouting around door frames

54. This claim relates to grouting work done by Forest to the openings between the door frames and block walls of the apartment units and of the lift lobbies. The total claim is for \$121,072 on the basis that Forest is entitled to receive \$156 for each of the 696 apartment units and \$71 for each of the 126 lift lobby door frames. Nakanos position is that grouting around the doors was part of the negotiated price for internal plastering works.

55. During cross-examination, Mr Ling admitted that grouting around door frames was not in Forests sub-contract. This was a significant concession since as far as Nakano was concerned, the normal sequence of work was to install the block wall first and then install the door. It was common ground that such a sequence of work would lead to gaps between the block wall and the door which would then require grouting. Under cross-examination, counsel for Nakano got Mr Shia to agree that installing the door first and then the wall (which would eliminate the need for grouting) was the old fashioned way of proceeding. Since Nakano knew that the walls were to be installed first and thus grouting would be required, it should have specified that the internal plastering included such grouting. Its failure to insert such a term in the sub-contract is significant.

56. I find in favour of Forest in this issue and award it \$121,072.

2.4 Rectification of external walls

57. This claim for \$273,275 relates to work which Forest did to rectify debonded external plaster. It is Forests case that the debonded plaster resulted from Nakanos fault and was not due to its own poor workmanship. Nakano alleges the opposite and has counterclaimed for its own cost of rectifying defective work. I will consider this issue when dealing with the counterclaim.

2.5 Filling in of gaps between door jambs and reinforced concrete walls

58. Forest claims \$11,616 for filling in the gaps between the lift door jambs and the concrete lift shaft with lightweight blocks at block 19. Nakanos position is that Forest did not do this work.

59. Forests evidence in respect of this claim was given by Mr Koon. He stated that, as far as he was aware, Nakano had instructed Forests site engineer, Mr Cai Yoa Zhong, to commence these variation works. Further, some time in July 1999, he himself saw Forests workers at block 19 filling in the gaps between the lift door jamb and the concrete lift shaft. Mr Cai himself did not testify.

60. On the other hand, Nakanos witness Mr Quek testified that he did not issue any variation order to Forest to grout these gaps. He had considered getting Forest to do the job but, as he had received poor report on their progress, he decided to award the work to another sub-contractor, Kow Sang Woodworks. He stated that Nakano had told Kow Sang Woodworks to go ahead and start the work in July 1999 and that a purchase order was issued for this purpose. The documents attached to Mr Queks affidavit showed that Kow Sang Woodworks quotation for these works (which probably extended to all the blocks and not simply to block 19 as it did not contain any reference to any particular block) was dated 11 August 1999. Further, the purchase order issued by Nakano was dated 12 August 1999 and specified the date of commencement of work as 16 August 1999.

61. It appears from the documents produced by Nakano that Kow Sang Woodworks was only engaged in August 1999. No document has been produced to show that Kow Sang Woodworks did, and was paid for, work at block 19. On the other hand, there is Mr Koons clear evidence that he saw Forests workers doing such work at block 19 in July 1999 ie prior to the engagement of the other contractor. I accept Forests submissions on this point and award it \$11,616 as claimed.

2.6 Extra over thickness of internal wall plastering

62. The sub-contract provided that Forest would apply 8 mm of plaster to the internal walls. The claim here arises from the contention that in fact Forest had to apply plaster that was 10 mm thick on the areas of the block walls which were adjacent to the door frames in order to ensure that the door frames merged with the block walls and did not jut out. This was because the door frames were 120 mm wide whilst the block walls were 100 mm wide so that the door frames protruded to the extent of 10 mm on either side of the adjacent block walls. An application of plaster that was only 8 mm thick would not have completely eliminated the protrusion.

63. Nakano resisted Forests claim to be paid for the extra 2 mm of plaster applied around the door frames. Various objections were put forward. The first was that whilst the internal wall plastering commenced in September 1998, it was only on 1 July 1999 that Forest mentioned that it had to provide an extra 2 mm of plaster adjacent to the door frames and that it was incurring extra material costs. Further, the variation claim itself was only submitted in January 2000. Secondly, Forest was trying to isolate the internal walls with door frames from the rest of the internal walls despite the fact that the sub-contract did not make such a

distinction. Nakanos position was that the 8 mm thickness specified in the sub-contract referred to an average of 8 mm. There would have been areas where the plaster thickness was less than 8 mm and therefore as long as the average thickness of the internal plaster was 8 mm, Forest was not entitled to make any claim for over-thickness. Thirdly, Nakano submitted that there was no evidence that Forest did plaster a 10 mm thickness throughout the wall. In any case, it was submitted that 2 mm was negligible in terms of labour as well as the amount of plaster used when the sub-contract was considered as a whole.

64. I do not find much merit in Nakanos submissions. My opinion is that the 8 mm in the sub-contract referred to a fixed thickness and not an average thickness. This opinion is based on a construction of the wording in the sub-contract. That is straight-forward with no indication that a varying thickness was contemplated or submitted. Secondly, there is not much in the point of delay in making the claim. Although the bill was not submitted until January 2000, Mr Shia had, as early as November 1998, informed Mr Ling of the additional thickness required and that this item of work was a variation. This was confirmed by the letter of 1 July 1999.

65. Thirdly, Forest did not try to draw any distinction between the block walls adjacent to the doors and the rest of the block walls. All it contended was that it had to plaster a thickness of 10 mm at either side of the block wall adjacent to the door frame in order to prevent the door frame from protruding. Nakanos evidence supported this. Mr SF Wong confirmed in court that there was a defined area of 34,314 m of block wall that required 10 mm of plaster and a defined area of 83,314 m of block wall that required 8 mm of plaster. Mr Wong also testified that Nakano had told him that the areas with the door openings required plaster of 10 mm thickness because of the protrusion of the door frame. Fourthly, the extra thickness of 2 mm was not insignificant as contended by Nakano. Mr Wong admitted that in proportional terms 2 mm represented a 23% increase over the original thickness of 8 mm.

66. In my judgment, Forest is entitled to recover for the extra 2 mm of plaster applied to 34,314m of block wall. The question is as to the rate that it is entitled to charge. On the basis of the agreed rate of \$10.50 per m to apply 8 mm of plaster, Forest calculated that it cost them \$13.125 per m to apply 10 mm of plaster. It therefore claimed an extra \$2.625 for each square metre where an additional 2 mm of plaster had been applied. Nakano submitted that the rate should not provide for additional labour as plastering an extra 2 mm is within reasonable tolerance and did not involve any additional labour. It argued that, if at all, Forest would be entitled to claim for additional cost of material only. It appears to me that whilst there must have been some additional labour costs incurred in applying a thicker layer of plaster, it is not correct to obtain this cost by simply taking a proportion of the original agreed rate of \$10.50 per m. This is because there would be some overlapping in the work done. There is already an agreed rate for application of 10 mm thick plaster. This is \$12.50 per m ie the agreed figure for the external plastering. I think this rate should also be applied to the areas of the internal walls which received that thickness of plaster. On this basis, Forest should receive an extra \$2 per m for the 34,314m of block walls which adjoined the door frames. I therefore award Forest \$68,628 for this work.

2.7 Plastering of separation walls

67. Forest claimed that the original scope of the internal plastering walls under the sub-contract did not include plastering of the separation walls. Nakano subsequently instructed Forest to do this work and Forest therefore claimed \$129,856.50 for the same.

68. In its submissions, Nakano did not deal with liability for this work but only with quantum. It pointed out that Forest was now claiming it should be paid at the rate of \$13.50 per m whereas previously it had claimed that the rate should be \$15.50 per m. Nakano asserted that whilst Forest had claimed that it had to apply, on the average, plaster that was 15 mm thick, it had not produced any evidence that this had been done throughout all the separation walls. Nakano submitted that since the separation walls were within the apartment units and not exposed to weather, they should be considered as internal walls and the court should adopt the internal wall plastering rate of \$10.50 per m.

69. The evidence showed that originally Nakano had planned to skim coat the separation walls. The subsequent decision to plaster them was made because it discovered that the separation walls were not even and plastering was required to smoothen

them out. Mr Shias evidence was that when Nakano asked him to carry out this additional item of work, he made investigations and was informed by his site supervisors that to adequately plaster these walls, an average of 15 mm of plaster would be required. On 26 August 1999, Mr Shia put in a quotation for his work at the rate of \$15.50 per m. In the quotation the thickness of the plaster to be applied was put as being 15 mm. Although Nakano did not formally accept this quotation, it must have been aware of its existence when it instructed Forest to proceed with the work. Further, it must have been aware that Forest was intending to apply 15 mm of plaster to the separation walls. In these circumstances, I do not think it lies in Nakanos mouth now to quibble about the reduction from \$15.50 per m to \$13.50 per m or to suggest that the correct rate should be \$10.50 per m on the basis that only 8 mm of plaster was required. Accordingly, I award Forest \$129,856.50 for the 9,619 m of separation walls plastered at the rate of \$13.50 per m.

2.8 Amount of previous payments made

70. It is Forests case that the total amount paid to it by Nakano pursuant to the various sub-contracts was the sum of \$4,402,786.08. The full details of all receipts from Nakano are contained in Appendix 5 to Mr Choos second affidavit. Nakano on the other hand asserts that it had paid Forest \$4,460,716.80. The difference between the two amounts is \$57,930.72. Forest submitted that Nakano had made a mistake in calculating the amount paid because it had wrongly included payments which were due to Forest for another project.

71. Nakano submitted that this discrepancy was in fact due to Forests own failure to properly account for the full sum of \$165,747.63 which Nakano had paid to Forest pursuant to BOTM cheque number 014148 dated 7 December 1999. This was Nakanos first answer to the calculation.

72. Appendix 5 to Mr Choos second affidavit shows the payments Forest received in December 1999. It credited Nakano with paying it during that month the sum of \$7,500.25 in respect of the solid brick walls, \$3,857 in respect of the steel lintels, \$40,850 in respect of tiling works, \$87,762.90 in respect of the block works and external wall plastering, and \$13,300 in respect of the internal wall plastering. This table therefore shows that Forest acknowledged receiving a total of \$153,269.90 in December 1999. Thus, only \$12,477.73 of the amount paid by Nakano that month is unaccounted for in Forests accounts. At the most, therefore, Nakano has been able to establish that Forest received \$4,415,264.38 (ie \$4,402,786.55 + \$12,477.73).

73. Forest did not produce any documents establishing that any part of the \$165,747.63 paid by Nakano in December 1999 had been credited to the amounts due from Nakano on the other project on which it had employed Forest. In the absence of such evidence, I have to hold that the full \$165,747.63 should have been credited to the amounts payable for the Woodsvale project. Accordingly, Forest has not been able to establish that it received only \$4,402,786.08. In my judgment it received \$4,415,264.38.

74. The other objection that Nakano raised to Forests account was that it did not reflect 14 invoices and credit notes which were sent by Nakano to Forest between 28 July 1998 and 7 December 1999. These totalled \$7,985.50 and comprised, in part, charges for repairs to equipment allegedly damaged by Forests workers, and in part penalties imposed for various types of damage inflicted and infringement of safety rules and insubordination. Nakano did not lead evidence to establish that these invoices were validly raised and that Forest was legally liable to pay them. Accordingly, I disregard this objection.

2.9 Outstanding balance due to Forest

75. By reason of the findings above, the balance amount due to Forest is \$1,670,177.96 (excluding 3% GST) derived as follows:

(\$) (\$)

(a) Agreed value of original sub-contract works	5,100,896.76
(b) Agreed/Undisputed variation works	34,501.40
(c) Variation works awarded:	
(i) extra thick external plaster	592,575.00
(ii) hacking keys	8,473.80
(iii) entrance canopies	17,822.88
(iv) grouting door frames	121,072.00
(v) filling in of gaps	11,616.00
(vi) extra thick internal plaster	68,628.00
(vii) separation walls	129,856.50
	Sub-total:
	6,085,442.34
(d) Less previous payment:	4,415,264.38
	Balance due:
	1,670,177.96

Issues relating to wrongful termination and counterclaim

1. Forests claim for wrongful termination

76. On 13 January 2000, Nakano wrote a letter to Forest entitled Termination Warning. The letter referred to various written reminders to Forest to re-plaster the hacked areas in the external walls of the blocks and in particular to a letter dated 18 December 1999 which enclosed lists of the locations to be re-plastered. It went on to note that despite this notice and the further chance afforded to Forest to complete the re-plastering by 6 January 2000, it had failed to do so. Further, instead of stepping up the work, the number of workers attending to the plaster works on site had decreased. Forests letter of 7 January 2000 put it beyond doubt, according to Nakano, that Forest had no intention of fulfilling its contractual obligations. The letter went on to deal with the defective works and alleged that Forest was in default of its contractual obligations. Nakano ended by giving

Forest notice that it might terminate Forests employment.

77. The next day, 14 January, Nakano sent Forest a further letter. This was entitled Termination for Defaults (*sic*). It referred to the letter of 13 January and stated that Nakano accepted Forests wrongful repudiation of its sub-contracts by terminating Forest with immediate effect. Forest was asked to ensure that its remaining workers vacated the site immediately. It was also notified that Nakano would be appointing alternative contractors to complete the remaining sub-contract works, including rectification of the defective works. All costs incurred would be charged to Forest. Nakano also reserved its right to claim damages from Forest.

78. The position taken by Forest throughout the trial was that its sub-contracts for plastering works were prematurely and wrongfully terminated. As a result of this early termination, Forest was unable to earn the profit in respect of work not performed which it would have earned had the sub-contracts continued to their natural conclusion. Forest seeks compensation of \$7,264.24 for the wrongful termination.

2. Nakanos position

79. Nakanos position is that it was fully entitled to terminate the sub-contracts and that Forest was the party in default. It claimed various amounts from Forest arising from defective work, delays and the necessity of employing alternative contractors to complete Forests work. The validity of some of these claims depends on the validity of the termination notice.

80. In its re-re-re-amended defence and counterclaim filed on 6 September 2000, Nakano cited condition 19 of its conditions of sub-contract. That condition is entitled Termination by Contractor and sets out the procedure whereby the contractor may send the sub-contractor a termination warning and, within two weeks thereafter, a notice of termination of the employment of the sub-contractor. Nakano admitted that it had terminated Forests sub-contract on 14 January 2000 and stated that it would rely on the terms of the sub-contracts for their full intent and purposes.

81. Nakano went on to plead that Forest:

- (1) had failed and/or neglected to properly install the tiling works;
- (2) had failed to complete the solid brick wall sub-contract works;
- (3) had failed to complete its sub-contract for block wall and external wall plastering by 30 October 1999 and that for internal wall plastering by 30 September 1999 and thereby held up the rest of the main contract works;
- (4) had failed and/or neglected to properly install the block walls and the internal and external wall plastering in that:
 - (a) Forests inferior workmanship and lack of preparation of the substrate surface resulted in a failure in the bonding within the plaster and between the plaster and the substrate thereby causing hollows in the plaster;
 - (b) despite repeated written and oral reminders by Nakano, Forest failed, refused and/or neglected to rectify the defective plastering;
 - (c) Forest was substantially behind its schedule of plastering works as at July/August 1999;

(d) having agreed to effect rectification works to the defective plaster wall by hacking out the parts of the plaster that were hollow, Forest failed to make good the defects but left substantial portions of the hacked areas un-replastered and, further, failed to attend to other areas of defective plaster at all; and

(e) despite promises to speed up the works, the number of workers sent by Forest to the site progressively decreased.

Nakano went on to plead that because of the matters that I have set out in para 81(4) above, it had sent a termination warning to Forest to terminate the sub-contracts relating to the plastering of the external and internal walls in accordance with clause 19(2) of the conditions of sub-contract. The termination notice was then served the next day. Alternatively, Nakano pleaded that it would rely on those same matters to say that Forest had effectively repudiated the block wall and external and internal wall plastering sub-contract works which repudiation was accepted on or before 14 January 2000.

3. Legal position

82. As I have already held that the conditions of sub-contract appended by Nakano to its purchase orders did not form part of the sub-contracts between Nakano and Forest, Nakano cannot justify its termination of those sub-contracts on the basis of condition 19. Accordingly, Nakano has to rely on its common law rights to justify the termination. Under general law, not every breach of contract by one contracting party justifies the other (the innocent party) in terminating the contract. Action to terminate can only be taken when the defaulting party has evinced an intention to itself repudiate the contract.

83. As held by the Court of Appeal in *San International Pte Ltd v Keppel Engineering Pte Ltd* [1998] 3 SLR 871, a defaulting party repudiates the contract when he intimates by words or conduct that he is or would be unable to perform his obligations in some material respect. Short of an express refusal or declaration, the test is to ascertain whether the action or actions of the party in default are such as to lead a reasonable person to conclude that he no longer intended to be bound by the provisions of the contract. However, even if the defaulting party's conduct does amount to a refusal to perform, it does not follow that the innocent party would be entitled to terminate the contract unless the repudiation deprives the innocent party of substantially the whole benefit which was the intention of the parties that the innocent party should obtain from the obligations of the parties under the sub-contract then remaining unperformed. The Court of Appeal opined that the materiality of the refusal must be weighed in the context of the obligation then remaining unperformed and that this test was particularly applicable in the context of construction contracts where progress payments are provided for works already completed so that at the time of termination the parties are primarily concerned with the remaining unperformed obligations and the impact on them of the particular breach. (See 25 and 26 of the judgment.)

4. Were the works delayed: (a) applicable completion dates

84. Whilst the pleadings, as summarised in 81 above, appeared to indicate that Nakano would be relying on a whole host of allegations to justify terminating the sub-contracts, its written submissions proceeded on narrower grounds. In closing, Nakano averred that Forest had repudiated the plastering sub-contracts by its repeated failure to complete the works within the agreed deadlines and by removing most of its skilled workers from the site some time towards the end of December 1999 or in early January 2000 when there were still substantial areas where the plastering work was incomplete.

85. The first sub-contract was for the block wall and external wall plastering works. Nakanos purchase order for this sub-contract

provided that the works should commence on 17 August 1998 and be completed on 30 October 1999. In relation to the sub-contract for the internal wall plastering, Nakanos purchase order indicated a commencement date of 7 November 1998 and a completion date of 30 September 1999. I should state here that I accept that the two dates indicated as completion dates in the two purchase orders were the contractually agreed completion dates. First, they were embodied in the purchase orders which were contractual documents and secondly, Mr Shia did not complain at any time during the course of the project to Nakano that he had not agreed to those dates. That lack of complaint must reflect an acceptance on his part.

86. Although both the internal and external plastering works were started before the issue of the respective purchase orders, Forest was not able to complete these works by the indicated dates. Nakano complained that despite being given final extensions to 15 November 1999 (for internal plastering works) and 15 December 1999 (for external plastering works), Forest had failed to complete the work even by 14 January 2000, the date of termination.

(b) Extent of works not completed on 14 January 2000

87. As at 14 January 2000, substantial areas of the external walls remained unplastered or so Nakano alleged. According to Nakanos evidence, the total external area to be plastered was 85,565 m of which Forest left 28,466 m (or 31%) unplastered. As for the internal areas, those not plastered by Forest as at 14 January 2000 were the penthouses of blocks 9A and 9B (wholly unplastered); the penthouses of block 9C (partially plastered); the air-conditioner ledge kerbs of blocks 9A, 9B, 9C and 11B; the access openings of blocks 9A and 9B; the type E1 & E2 penthouses of blocks 3 and 5; the staircase accesses of blocks 9A, 9B, 9C, 11A, 11B and 11C; certain other small areas in block 19; and certain areas near the pipe shaft opening of all the blocks and some other areas in the vicinity of the staircases of all the blocks.

88. There are some difficulties, however, with Nakanos evidence relating to the unplastered areas. First of all, at the time Nakano did not consider that 31% of the external plastering had not been completed. At the beginning of December 1999, as shown by the minutes of a site meeting, Nakano reported to the developer that 82.1% of the external plastering had been completed. Mr Ling testified that this was the case but asserted this was an estimated figure.

89. The figure of 31% was derived from figures given in Mr SF Wongs report. According to his measurements, the total area of external walls requiring plastering amounted to 85,565 m. The report also stated that the area that had not been completed was 28,446 m. When Mr Wong gave evidence, however, it appeared that the area of 28,446 m had not been physically measured by him. He had made only one site visit and that took place on 10 March 2000 by which time the plastering work was in the course of completion. Mr Wong spent four hours on site but did not take any actual measurements of the plastering works at that time. He testified that his measurements of the quantities of the plaster were based, not on actual site measurements, but on the drawings and plans supplied by Nakano. Further, he had depended on Nakano to identify to him the areas of plastering which had been carried out by Forest. Mr Wongs evidence was therefore not primary evidence on the amount of work left undone by Forest.

90. There is also doubt about the correctness of the information given by Nakano to Mr Wong. Presumably this information was similar to that contained in a list which Nakano gave to Mr Law. That document listed all outstanding external plastering work and Mr Law then went round the site with Nakanos representatives in order to verify this list. The list was produced in court and it is an impressive document running through some five pages with over 40 items on each page. When Mr Law was cross-examined about it, however, he admitted that many of the items in the document did not relate to distinct areas but related to the same area and the photographs taken reflected this in that they did not always show distinct areas but often showed the same area from different angles. The number of items therefore did not indicate directly how many areas were left unplastered.

91. The onus lay on Nakano to prove the extent of the areas remaining unplastered as at the termination of the sub-contract. It has not established to my satisfaction that 31% of the external wall area remained unplastered. I accept, rather, the figure given to the owner in December 1999 as that was the contemporaneous estimate made and it must have been reasonably accurate since the developer would have had consultants on site with the ability to carry out a physical check. Further, there were no

records kept by Mr Law on the incomplete internal plastering. As Forest submitted, this was probably because the internal areas where the plaster work had not been completed were not large enough to pose a problem for Nakano who had managed to complete the same by the time Mr Law carried out his inspections between 31 January 2000 and 3 February 2000 and on 15 February 2000.

(c) Was there delay?

92. It was common ground that the plastering of the external walls had to be carried out in segments in accordance with the concrete casting of the external frame of each apartment block which also proceeded in segments. The concrete form work was cast in segments of four storeys per block each time. Once the casting of one segment of a block had been completed, the Doka framework was removed and taken to the another block. Eight to 12 weeks would elapse between the casting of one segment of a block and the return of the Doka for the casting of the next segment of that block. The concrete had to harden and then BBR had to grind it and remove silt and protrusions before Forests plastering work could commence. Nakano submitted that Forest had at least six weeks to plaster the external walls of each segment before the Doka returned. It further submitted that there were many instances when Forest started plastering a segment but failed, due to the lack of manpower, to complete the same before the Doka returned. This lack of manpower led to delays in the plastering since once the Doka returned, the hanging scaffoldings that Nakano had supplied for the use of the plasterers had to be removed and plastering work on the segment had to stop until the Doka left that block again.

93. Nakanos witnesses asserted that Forest lacked manpower and it was this lack rather than various other matters (eg a lack of scaffolding) put forward by Forest as excuses that was the main cause of the slow progress of the plastering works. Nakanos witnesses further stated that they had sent chasers to Forest to increase the number of plasterers but that these were ignored. Many of the segments had to be abandoned as a result of Forests slow progress. According to Mr Ling and Mr Steven Lee, Nakano had provided about 78 sets of hanging scaffolding at the site and this meant that three of the construction zones had 23 to 25 sets of scaffolding each intending to cover the perimeter walls of two units of each segment. However, often the hanging scaffolding was left unused. As Forest did not have enough workers, additional sets of scaffolding were not brought in for the fourth zone. Instead, the sets on site were re-deployed among all zones from about February 1999.

94. It was Nakanos contention that for Forest to keep out with the sequence of casting works and within Nakanos schedule, it needed to have at least 17 workers per block working on the 25 sets of hanging scaffolding provided over each segment. Since there were four zones, Forest required about 68 plasterers to carry out plastering work simultaneously in all the zones. Nakano pointed out that Forest had not supplied the total number of plasterers it had available for the works. Instead, Mr Koon had stated that depending on the availability of the working area provided by Nakano, a few groups of skilled workers, each group consisting of approximately five skilled workers, would be engaged to carry out the work at the available locations. In court, however, Mr Koon claimed that he would send two or three workers up per scaffolding and that two of these would be skilled whilst the third would be a general worker. He also claimed that Nakano had provided only about 16 sets of scaffolding for each segment. He then claimed that he would need more than 20 plasterers for these 16 sets. On this basis, Forest would have needed 80 plasterers to work in all four zones, 12 more than the figure estimated by Nakano.

95. Nakano submitted that Forest never had 80 plasterers for the external plastering. Mr Koon, though unable to give even a rough estimate of the number of plasterers on site, claimed that Forest had workers on every available scaffolding platform throughout the site and that it was Nakano who did not have sufficient hanging platforms. On the other hand, the evidence of Nakanos foreman, Mr Lee, was that Forest had only four to five workers for the corner beading and the level pegs for all four zones whilst it had eight to nine plasterers in each of the four zones. Nakano had often asked Forest to increase its labour force. One such request was documented in Nakanos letter of 8 September 1999 which referred to a promise made by Mr Choo to mobilise an additional 27 plasterers by 12 September 1999 to add to the then existing site workforce of 32 plasterers.

96. Mr Koon asserted that during the course of the project, he had insured that the number of workers engaged at the site was sufficient. Based on Forests records, an average of 64 skilled workers and 32 general workers were engaged per day. The general

workers were engaged directly by Forest whilst the skilled workers were either direct employees or obtained from labour sub-contractors. Mr Koon also said that during the period September and November 1999 Forest had engaged an average of 150 skilled workers and 32 general workers per day. A physical inspection of the site was undertaken by Nakano towards the end of November 1999. At that point, Forest was found to have 104 workers on site, a substantial number although somewhat below the 182 figure given by Mr Koon for that period.

97. Mr Koons assertions were not, however, substantiated by documentation. Forest does not seem to have kept complete and accurate records. Certain records showed that another contractor had supplied Forest with 15 plasterers between August and November 1998. Other payroll records produced by Forest apparently indicated that it employed 20 to 30 general workers from October 1998 to January 1999 and thereafter, in addition to the general workers, 15 skilled workers. No records of the actual number of plasterers working at the Woodsvale site were kept by Forest. Mr Shia himself insisted that he had some Chinese plasterers but there are no records of the number of these workers. Mr Shia was not able to remember the number of plasterers on site nor could he explain the payroll records. Mr Koon himself was not able to say how many of the skilled workers who were supplied to the site were plasterers as there were also skilled workers for block laying and tiling.

98. On 10 October 1999, Nakano wrote to Forest. It expressed its regret that despite several reminders regarding sub-standard quality of workmanship and work progress, Forest had not taken Nakanos instructions seriously. It further stated that since Forest had not been able to meet Nakanos schedule, it had extended Forests final completion dates for brick works to 21 October 1999, for internal plastering to 15 November 1999 and for external plastering to 15 December 1999. Forest was informed that if it failed to improve its work performance and quality immediately, Nakano would have no alternative but to accept Forests wrongful repudiation of the contract by appointing alternative contractors and looking to Forest for all loss and expense. It appears from this letter that Nakano was very frustrated with the progress of the work and was beginning to build the case for termination. Mr Shia received this letter. He did not dispute its contents. Mr Koon was aware of it as well. He asserted on the stand that at the time he received the letter he thought that he should be able to finish the external plastering within two to three months ie around mid December 1999.

99. In the event, by 14 January 2000, despite further agitation by Nakano and several inspections of the site at which unfinished work was pointed out to Forests representatives and promises were made to complete same, the internal and external plastering works were not complete. In my opinion, Forest had been slow. The question is whether such delay justified the action taken by Nakano to terminate the relevant sub-contracts.

(d) Did delay justify termination?

100. At that time, Nakano had an obligation to deliver the completed project to the developer by 6 May 2000. Its concern was that because of the slow progress of the plastering works it would not be able to do so. This was because even after the plastering works had been completed, there would be painting and external works to complete and the authorities would have to inspect the project and issue the necessary approvals. Painting work scheduled for end December 1999 by Nakano had been held back due to the incomplete plaster works.

101. Nakano was also concerned because its foremen saw a significant decrease in the number of plasterers in early January 2000. Mr Koan Ping Seng and Mr Lee recorded the number of plasterers at the site on 7, 8, 9 and 10 January 2000 and these records showed that on those days, there were only about 15 plasterers on site, roughly half the normal strength.

102. Whilst Nakanos concern over the slowness of the work and the apparent decrease in plasterers is understandable, that does not mean that it was justified in terminating the sub-contracts. As held in *Felton v Wharrie* [1906] Hudsons BC 4th ed Vol 2 p 398, delay to the works per se does not amount to repudiation unless it is of such magnitude and character as to show that the contractor is either unable to proceed with the works or has no intention of proceeding with them. At the time of termination, Nakano itself was not yet late under the main contract and therefore the termination was an anticipatory one based on the concern that if Forest continued to be slow it would inevitably delay Nakanos own work. There was no clear evidence of how

allowing Forest to continue would have delayed Nakanos own completion. As it was, the rectification work carried out by Acolite after Forest was terminated was not completed until around the end of May or June 2000 and, according to Mr Hattori, other works that had to be done after this rectification work took a further two months. Thus, the termination itself caused delay and there is no evidence that had Forest continued to work on the project it would not have been able to complete at the same time that Acolite did.

103. Further, the slow progress of the plastering works was not entirely due to default on the part of Forest. Nakano had a role to play in this as well. For one thing, Forests plastering work was given a lower priority than the concreting works. This meant that any disruption in BBRs work resulted in serious disruption to Forests work and, secondly, resources that Nakano were already short of were allocated first to BBR rather than to Forest. Mr Ling agreed that priority in the use of resources was given to BBR to enable them to catch up with the casting schedule and that the hanging platforms had been removed without regard as to whether Forest had completed applying plaster so as to make way for the Doka form work to be brought back to enable BBR to cast the next segment.

104. Secondly, a number of walls or parts thereof were not always ready for plastering by Forests workers. The protrusions on the walls were not always trimmed, as admitted by Mr Ling, as it was presumed that the plastering would hide the defective concrete. There was evidence in the form of admissions by Nakanos witnesses that at the time of termination some wall surfaces had not been ground by BBR and/or Nakano and therefore were not ready for plastering work. There were also delays in the inspection of the concrete work which in turn led to delays in commencement of plastering work. Further, even at the date of termination the window sills had not been installed in a number of blocks so that Forest was unable to plaster the areas around the window sills. Mr Lee agreed that the minutes of a site meeting held at about that time showed that window sills in blocks 9A, 9B, 11A and 11C had still to be hacked to enable installation of the windows.

105. It was also significant that Nakano was rather haphazard in the communication of its construction programme to its sub-contractors including Forest. In evidence-in-chief Nakano had asserted that it had briefed the respective sub-contractors on the sequence and timing of their respective works. Nakanos witnesses alluded to a master programme. During cross-examination Mr Hattori agreed that the plastering programme should have been agreed in consultation with Forest as the sub-contractor responsible for carrying out the plastering work. He also agreed that Forest was not consulted on the original master programme but asserted that there was a revised programme and that during negotiations he had informed Forest that each segment of concrete had to be plastered within four months.

106. Whatever Mr Hattori might have told Mr Shia during negotiations, there was no evidence that Forest was consulted in relation to the revised master programme which was submitted to the architect in February 1999. Mr Hattoris testimony was that he had no idea whether Mr Shia was consulted on this. When he was asked if he had told Mr Lee to consult Mr Shia, his reply was that he could not recall whether he gave specific instruction to his staff members at this time but they understood that when they needed to revise a schedule they were supposed to consult particular contractors. Mr Lee when asked about this stated that he himself had not been consulted about the revised schedule. If that was so, he could not have consulted Mr Shia about it.

107. It would appear therefore that the sequence and timing of the work were planned by Nakano without any contribution from Forest. Instead, it was simply briefed on the programme by Nakano. Mr Ling remembered that he had briefed Mr Shia on the schedule which he needed to follow until the project was completed. By this he meant that he had told Mr Shia that the plastering work had to be completed some time in July or August 1999 but he had not given him any written schedule. When he was asked whether he would agree that most of the time Forest had been given only a vague idea of when particular work had to be completed without any firm deadlines, Mr Ling agreed after stating that he had verbally given Forest a schedule every day.

108. In any case, the master programme did not even properly mention or provide for the plastering works. Mr Ling attempted, under questioning, to fit these works into the general categories of architectural works and, alternatively, external wall finishing. Both of these, however, were much wider categories encompassing more areas of work. The plan, therefore, failed to precisely indicate the schedule for the plastering works. This lack lends force to the submission by Forest that there was in reality no plan and at best, decisions were taken on a weekly basis as to where, how and when Forest should carry out its plastering work. To me it appears as if there was a general idea as to what needed to be done within what time frame but without specific deadlines

within the general outline. Since the work was segmented and dependent on the progress of the casting work it would have been very difficult to lay down specific deadlines.

109. Having considered the evidence as a whole, it appears that whilst Forest did not work as fast as Nakano desired or as fast as it could have, there were various reasons for the slow progress and among these were deficiencies on Nakanos part as well. It was not all Forests fault. Further, it was not at all clear at the time of termination that delays on the part of Forest would have a devastating impact on Nakanos work. Instead of resorting to termination, an object which it seemed to have had in mind since October 1999, Nakano could have continued to chivvy Forest to hurry up and also made a claim for damages against it if in fact the completion of the project was delayed due to Forests slow speed. There was a submission made by Forest that because the word nil was entered against the heading liquidated damages on Nakanos purchase order, Nakano would not be able to claim even general damages had Forests delay caused it to suffer the same. It is not necessary for me to decide that point now but I should state that I find it difficult to accept the proposition that simply because it was agreed that there should be no liquidated damages clause, no damages at all could be claimed even if Forest was in default and its delay caused loss to Nakano.

110. Accordingly I find that Nakanos termination of the plastering sub-contracts was wrongful. Forest would be entitled to damages for wrongful termination. It has quantified these at \$7,264.24 which it says is the profit it would have earned from the sub-contracts if they had not been prematurely terminated. Details of this figure were set out in appendices to the statement of claim. Nakano has not challenged this quantification. I therefore award Forest \$7,264.24 in damages.

Nakanos counterclaims

111. Nakanos counterclaims are based primarily on Forests alleged failure to complete the sub-contract works, on defects in the external and internal plastering works and additional cost of rental for gondolas and platforms which resulted from Forests failure to complete within schedule. As a result of Forests termination, Nakano had to appoint alternative sub-contractors to complete the works and rectify Forests defective works. The particulars of loss are as follows:

- (a) overpayment for external plastering sub-contract (\$57,705.29);
- (b) Acolites invoices (ie \$803,235 less back charges of \$68,785);
- (c) Yu Bees invoices (\$971,156.91);
- (d) Hai Hwas invoices (additional costs of labour and materials)(\$85,327.89);
- (e) Kan Leongs invoices (additional costs) (\$98,875);
- (f) Wong Kam Thongs charges for rectification of Forests defective tiling works (\$13,050);
- (g) Gondolas and climbing platforms (\$415,146.62); and
- (h) Fines (not yet backcharged)(\$16,000).

In the light of my finding on the issue of termination, some of the above claims are no longer maintainable. I will deal with each claim in turn.

(1) Overpayment for external wall plastering

112. In Nakanos submissions, there is just one sentence on this claim. It reads Based on the agreed quantities for external wall plastering, the overpayment is \$57,705.29. There is insufficient material on this submission for me to accept it. Further, even if there was an overpayment of \$57,705.29 in respect of the plastering, all payments made by Nakano to Forest have now been taken into account in the calculation of what is due from Nakano to Forest as shown in 75. This claim is therefore not allowed.

(2) Acolites invoices ie payment for rectification of defective plaster

113. Nakano submitted that in relation to this claim, the two issues that arose were (i) whether the defects found in the plaster were the result of Forests failure to follow manufacturers specifications in relation to the application of Smartplas, its poor supervision of workers and poor workmanship and (ii) if so, what should be the quantum of damages.

114. For the purposes of determining the reason why such a large portion of the applied plaster debonded, both Forest and Nakano appointed experts to investigate and report. These were Mr Kenneth Hugh Jones and Mr CW Wong.

(a) Evidence of Mr Wong Chung Wan

115. Mr Wong is a qualified civil and structure engineer who holds a Masters degree in Building Science. He is presently head of the Construction Technology Division and General Manager of SETSCO Services (M) Sdn Bhd. SETSCO's investigation was commissioned on 1 March 2000. Mr Wong inspected the site physically on 6 March 2000. On the external facades inspection was made visually from the ground level and internally some of the units and staircases were inspected. Locations were selected for extraction of samples for laboratory analysis. Fourteen samples were taken altogether, seven from external areas and seven from internal areas. In both cases, samples were extracted from sound areas, areas with hollow sounding and areas with cracks accompanied by hollow sounding. As there was no specific pattern of distribution of the defects, the samples were extracted randomly from accessible areas.

116. Mr Wong took the samples back to his laboratory and subjected them to various tests. One of these tests was a Petrographic examination to determine the plasters microstructure and composition. He also prepared samples of plaster from fresh bags of Smartplas. Two samples were prepared and applied in accordance with the manufacturers recommendation. The plaster was applied onto a G40 concrete substrate and the control samples were then subjected to the same sort of Petrographic examination.

117. In his report, Mr Wong stated that during the initial walk-around inspection, no clear pattern of distribution of the failure in the plaster could be detected. The failure appeared random, similar to the mode seen from photographs of the site which had previously been furnished to him by Nakano. These photographs indicated that the failure was widespread. As a result, subsequent detailed inspection was confined to blocks 5, 7, 9 and 17 which showed similar modes of distress. Unfortunately, due to access constraints, the physical inspection was confined to the lower storeys and no close up inspection of the external faade of the upper storeys was carried out.

118. In relation to internal plaster works, the visual inspection was made at the reinforced concrete staircase shaft. It was observed that:

- (1) hollow sounding areas were often accompanied by pattern-cracks (0.2 to 0.5 mm in width);
- (2) detachment (falling off) of plaster had physically occurred in considerable areas and bulging of debonded plaster was evident;
- (3) web-like pattern cracks were found even in areas without hollow sounding;

(4) thickness of plaster varied widely from 9 to 20 mm;

(5) debonding failure occurred mostly between the plaster and the concrete substrate and to a lesser extent, between the different layers of the plaster.

119. Having completed the visual inspection of the site and the laboratory analysis of both the samples taken from the site and the control samples made up and applied in the laboratory, Mr Wong came to the following conclusions:

(1) the failures observed on site appeared to be widespread, with no apparent consistent pattern or distribution. On concrete substrate, ie, external walls and staircase walls, the failure manifested as debonding of the plaster and was often accompanied by cracks. These cracks appeared largely as random pattern cracking, similar to shrinkage. The mode of delamination was mostly failure between the plaster and concrete substrate and debonding between layers of plaster. Bulging of the debonded plaster was also evident.

(2) The appearance of random pattern cracks on the plaster indicates those that are usually caused by shrinkage. This is likely due to inherently high shrinkage of the plaster or/and cracking due to shrinkage. Higher shrinkage is usually expected for the mixes that have higher amount of water than the amount recommended. Too much water in the mix causes a reduction in strength of the plaster, higher shrinkage of the plaster and would have contributed to the debonding of the plaster from the substrate or between layers.

(3) The adhesion bond strength of both the control samples exceeded the minimum requirements spelt out in the HDBs specification. This is despite the slight deviation in the mode of application for control #2.

(4) Petrographic examination of plasters extracted from site and compared against laboratory simulated samples revealed that:

(i) signs of efflorescence or cement laitance were detected along the interface between the base and final coat. Such deposits are caused by the migration of the plaster constituents from within the plaster mix to the surface of the coat. Such a migration would not occur if the right mix of powder and water was adhered to. In any case, these deposits should have been removed/cleaned before plastering, as it will inhibit adhesion.

(ii) where debonding was reported, there was significant amount of voids along the plaster and concrete interface. This indicates the lack of a tight application of the base coat to the concrete substrate. The simulated samples showed very good contact between the base coat and concrete substrate with small amount of voids along the interface. The lack of the tight base coat would have resulted in poor adhesion between the plaster and concrete substrate;

(iii) over combing of the base coat was also detected resulting in cutting through of the base coat into the concrete surface. This contravened the recommended practice as highlighted in the technical brochure;

(iv) large gaps and voids were found between the final and base coat, apparently due to insufficient pressure being applied when laying the final coat or poor workability of the plaster at the time of application. This has resulted in poor contact between the two layers and hence weak bonding. It is therefore not surprising to see failure between the base coat and final coat of the plaster on site.

(v) neither spatterdash nor key coat was detected, though recommended in the technical brochure. Similar recommendation is also given in BS 5262, which is also referred to in the technical brochure;

(vi) large variations in thickness of each layer were evident and in several occasions, the total thickness of the plaster exceeded the maximum of 20 mm recommended. In addition, the thickness of the final coat(s) generally exceeded that allowed by the manufacturer. Thickness of the samples extracted from areas without defects seemed to comply with the limit given by the manufacturer. A final coat that is too thick causes detachment of the plaster.

120. It can be seen from the above analysis that Mr Wongs main conclusion was that the debonding was due, in large part, to poor workmanship on the part of the plasterers. This manifested itself in too high a proportion of water being used in the mixing of the Smartplas, a lack of tight application of the base coat to the concrete substrate, over combing of the base coat, insufficient pressure being applied when laying the final coat, poor workability of the plaster at the time of application and lack of bonding agents such as spatterdash.

(b) Evidence of Mr Kenneth Hugh Jones

121. Mr Jones has 25 years experience as a professional building surveyor engaged in the assessment and appraisal of residential, commercial and industrial buildings. He is a fellow of the Chartered Institute of Building and of the Architecture and Surveying Institute and a member of the Australian Institute of Building Surveyors and the Australian Institute of Building. Prior to settling in Singapore in 1991, he provided building surveying services and technology services in Australia, the Middle East and the United Kingdom. According to his c.v., Mr Jones has extensive expertise in the diagnosis of building defects and the preparation of effective solutions to building problems, based upon extensive practical experience and an in-depth technical knowledge gained from 43 years of study and research.

122. At the beginning of 2000, Mr Jones company, Robinson Jones Associates Pte Ltd, was instructed by Forest to carry out a survey inspection and necessary investigations in order to establish the cause and reasons for localised bond failures between reinforced concrete walls and applied external plaster at the Woodsvale project. Mr Jones carried out a site inspection on 1 January 2000. This comprised a visual examination of the exposed reinforced concrete walls, the applied plaster and areas of the substrate where the debonded plaster was being replaced. No opening up of the fabric or the structure of the building was carried out. Three further visits were made to the perimeter of the site for the purpose of taking digital and infra-red

photographs.

123. Mr Jones investigations included examination of digital and infra-red photographs of the plastered and unplastered areas of the reinforced concrete walls, a study of the technical specifications of the premix plaster form work system and the pin-fixing system carried out by Acolite. He also examined samples of cured plaster removed from the walls and did calculations to quantify the actual average thickness of applied plaster.

124. On conclusion of his investigations, Mr Jones opined that the cause and the reason for the bond failure of the localised areas of the plaster resulted from some or all of the following factors:

(a) the reinforced concrete walls, which form the substrate to which the subject plaster has been applied, were constructed using system formwork with smooth forms, which produce a totally smooth finish;

(b) despite the use of smooth forms, no measures were taken to provide an appropriate keyed surface by scabbling the surface of the concrete, or wire brushing upon removal of the formwork;

(c) the placement of the concrete was erratic and had been over vibrated at some locations, resulting in a layer of weak material with a high silt content on the face of the concrete;

(d) the forms were not raised and set in a regular and even vertical plane, resulting in a need for significant variations in plaster thickness. This in turn has resulted in differences in the rate of thermal movement to the cured plaster and uneven stress at the bond joint between the plaster and concrete.

(e) it is possible that mould oil, or other release agents had been applied to the face of the forms and that the surface of the concrete could contain traces of these chemicals.

In summary, Mr Jones opinion was that rather than the defects in the plaster having arisen from bad workmanship, they had been caused by the nature of the concrete walls and deficiencies in the treatment, placement and vibration in the concrete. These were matters for which Nakano rather than Forest would be responsible.

(c) Discussion and findings

125. Dealing first with Mr Jones opinion, there are some difficulties with accepting all of his conclusions. The first possible cause of bond failure put forward by him was that the reinforced concrete walls were constructed using system form-work with smooth forms which produced a totally smooth finish. Mr Jones suggested that indented form-work should have been used when the concrete was cast. In cross-examination, however, he admitted that he had never seen this type of form-work used in Singapore. That being the case, there must be means of insuring that despite the use of system form-work like the Doka, plaster would adhere to the resulting smooth concrete.

126. Whilst the smooth surface may have contributed to the difficulties initially experienced in achieving a bond between the plaster and the external walls, it cannot have been the only or main cause of the debonding. This is because when the debonding first became obvious, Nakano instructed Forest to hack keys onto the concrete surface and also to use a bonding agent. Despite these steps delamination continued to occur thus disclosing that there were other reasons for the defects. It would also be noted that when Mr Wong made up a sample of plaster in his laboratory and applied it to a slightly roughened

concrete surface, he found the degree of adhesion of the plaster to the concrete to be good. This indicates that properly mixed plaster would adhere to the concrete once keys had been hacked into it.

127. The next opinion was that there was a high silt content on the face of the concrete because it had been over-vibrated resulting in a layer of weak material with a high silt content on the face of the concrete. This layer would inhibit the cementitious bond from coming into being between the plaster and the concrete substrate. Mr Jones opined that this layer of silt was the main cause of the debonding of both the internal and the external plaster. He stated that the appearance of the concrete, particularly its light grey colour and the smoothness of its surface indicated that high levels of fines made up of silt and other fine particles had migrated to the face of the forms during placing and compaction of the concrete.

128. During re-examination of Mr Jones, it turned out that he had not seen the surface of the concrete himself. He had simply relied on photographs of the substrate for his analysis of what the appearance of the concrete meant. Thus, his evidence was speculative rather than based on physical examination. On the other hand, Mr Wong had conducted a microscopic examination of samples of all the various layers of the reinforced concrete wall, including the substrate. During cross-examination, he stated that his investigations, both by way of visual inspection on site and by way of laboratory examinations of extracted samples, did not reveal silt on the surface of the substrate. He disagreed that the photographs showed obvious levels of silt on the concrete. He said it was very difficult to tell from photographs whether the concrete surface was covered by fines or not because the photographs showed concrete surfaces that had the same appearance as most concrete surfaces.

129. Further, even if there had been a layer of fines or silt at the surface of the concrete substrate, this layer would have been removed by grinding. Mr Jones agreed that grinding the surface of the substrate would remove all the silt. The evidence given by Nakanos witnesses was that grinding regularly took place and the whole surface of the wall was ground and not just the protruding areas. No doubt there were times when, as alleged by Forests witnesses, the grinding was slow or incomplete but there is no evidence that this was a widespread phenomenon or that the areas of debonded plaster were co-extensive with the areas which were not ground by Nakano or BBR.

130. Mr Jones third observation was that the forms had not been raised and set in a regular and even vertical plane resulting in a need for significant variation in plaster thickness. Mr Jones had come to certain conclusions on the thickness of the plaster applied. He had seen certain areas on the walls where plaster had been hacked off at the time of his inspection and in these cases the thickness of the plaster had ranged from 10 mm to 30 mm. Further samples of removed plaster were delivered to his office subsequently and these were between 19 mm to 49 mm thick.

131. Mr Jones, however, was not aware whether these plaster samples were taken from walls that allegedly had a verticality problem or exactly how much the alleged deviation from verticality was. His evidence was that he did not check the verticality of the walls himself. His conclusion that the walls were not raised and set in a regular and even vertical plane was based mainly on his observations of the hacking of a significant number of windows. During cross-examination, however, he agreed that the alignment of the window reveals had no effect whatsoever on the verticality of the form-work.

132. Mr Jones bolstered his opinion by suggesting that a possible reason for the alleged misalignment of the form-work was the combination of the system form-work with traditional form-work construction methods. During cross-examination, he admitted that this was his own suggestion and did not come from the suppliers of the Doka. He also admitted that the possibility was mere speculation and that he did not have any evidence of such a combination having taken place in this case. He further testified that he was not familiar with the Doka form-work and that he was basing his comments on it purely on the brochures.

133. Mr Jones was not able to support his theory that the walls were not set in a vertical plane. No doubt I have found that there were deviations from verticality as shown by Nakanos own records, but the extent of these deviations was not such as to be significantly outside of the permitted deviations required by the Singapore Code of Practice CP 23 as opined by Mr Jones. The verticality check results taken by Nakano were passed by the structural engineer as being within the permissible tolerances. Mr Jones was not aware of this position. It appeared to me that his view of the verticality problems was an exaggerated one. In any case, the significance of the verticality problems lay in Mr Jones view that varying thicknesses of plaster contributed to debonding. This view was severely undermined in cross-examination.

134. Mr Jones had stated that the variations in the plaster thickness had resulted in differences in the rate of thermal movement to the cured plaster and uneven stress between the plaster and the concrete. No calculations were given in support of this theory but only a sketch showing how the thickness of the plaster varied over the height of the wall. His theory was in areas of thicker rendering, the thicker mass of the plaster would expand linearly less than the thinner mass of plaster. Therefore, at the point where the thickness changed, the thinner plaster would exert a compressive force against the thicker plaster which would cause the thinner plaster to move outwards and away from the wall, thereby debonding.

135. During cross-examination, Mr Jones agreed that the formula for linear expansion of materials is the multiplication of the length of the material with the thermal coefficient of the material and the difference in temperature. It was put to Mr Jones that this formula did not take into account the thickness of the material and thus for a given material of similar length but of any given thickness, the amount of linear expansion would be the same for a given range of temperature. Mr Jones stuck to his theory but was unable to cite an alternative formula to account the thickness of the plaster. Thus, as Nakano submitted, there did not seem to be a scientific basis for Mr Jones thermal expansion theory. It should also be noted that Mr Jones eventually admitted that his thermal expansion theory would not cause debonding to occur if the plaster had properly adhered to the wall in the first place.

136. In any event, as Mr Jones admitted, since the internal walls of the buildings were not as exposed to the normal temperature changes as were the external walls, the large scale debonding of plaster that occurred in the internal areas was not due to thermal expansion. Under questioning by me, he also admitted that even externally, if everything else had been in order, the plaster would not have been debonded simply because of thermal movement.

137. In the course of his report, Mr Jones opined that vibrations emanating from concrete work on the higher storeys of a block could be transmitted to the completed sections of the walls below and that this vibration would to some extent disturb the bond between the newly applied plaster and the RC walls. In his conclusions, however, he did not include vibration as a cause of debonding. In view of this, I do not think I need to spend much time on this theory. I note that Mr Wong had disagreed with Mr Jones opinion on the basis that most of the vibrations generated by the poker vibrator used to compact the wet cement would have been absorbed by the cement itself. Even if the vibrator had come into contact with the form-work or the steel reinforcement, the vibrations would still be absorbed by the fresh concrete and the amount of vibration transferred down to the lower walls would be minimal. Further, for some blocks in the project, the plaster was applied to the external walls only after all concreting work to those blocks had been completed. Yet, debonding of the plaster on these walls still occurred. This evidence makes it highly improbable that vibration was a contributing factor to debonding.

138. The final possible reason for the debonding given by Mr Jones was that mould oil, or other release agents had been applied to the face of the forms and that the surface of the concrete could contain traces of these chemicals. This appears to me to be pure speculation since no tests on the concrete were carried out to ascertain the presence of these chemicals. Further, Mr Jones agreed in cross-examination that grinding and washing the walls before plastering would remove these chemicals. As I have stated earlier, grinding works were regularly carried out. Further, Forests evidence was that it would wet the walls before applying the plaster.

139. Turning to Mr Wongs reasons for debonding, as Nakano pointed out in its submissions, there was evidence which supported the theories that the plaster had not been properly mixed and properly applied by Forests workers. First of all, it was clear that neither Mr Shia nor his supervisors had ever read the specifications for Smartplas or the instructions as to how mixing of the material with water should take place. It is not surprising that their mixing process was not that recommended by the Smartplas manufacturer and whilst from the evidence the proportions of Smartplas and water mixed were roughly correct, it appeared that there was no system in the mixing and that what was done was done without any reference to the manufacturers instructions. Further, the mixing of plaster was not always carried out under supervision.

140. My impression of Forests supervisors were that they were rather rough and ready and also complacent. They were sure that what they were doing was correct. They relied on previous experience and did not take the trouble to study manufacturers instructions whether in relation to the use of Smartplas or to the use of the bonding agent Hydroment 476 Crete (Hydroment). The latter was added directly into the plaster mix which was a mode of use which was only prescribed when the plaster was

intended to be applied as a thin-set mortar. For the Hydroment to be used as a bonding agent, it should have been mixed with type 1 Portland cement to form a slurry bond coat. Mr Kumar and Mr Koon also gave contradictory evidence on the way that the Hydroment was used and the amount of water used in the mix at that time. I accept Nakanos submission in this regard that Forest had acted in contravention of the instructions set out in the specifications to the Hydroment by (a) adding water into the Hydroment; (b) using Smartplas instead of Portland cement and (c) by mixing one part of Hydroment with two parts of Smartplas and water.

141. I find Mr Wongs evidence persuasive. His opinion was clear and was not adversely affected during cross-examination. He was able to explain his methodology well. His findings indicate that more water was added to the plaster mix than was recommended by the manufacturers of Smartplas and that this was the cause of the high shrinkage of plaster that led to cracking and debonding. I also accept his evidence that a large number of air voids were found in the site plaster and this was contributed to by various types of poor workmanship on the part of Forests workers. I note that the number of samples taken by Mr Wong was small. In relation to the cause of the defective plaster, I accept his explanation that these samples can be regarded as representative although the debonding occurred over a large area because the failure areas showed a similar manner of distress and the failure appeared random.

142. Forest, in its reply submissions, criticised Mr Wongs conclusion that there was too much water in the plaster mix on the basis that in the original report, this conclusion was based on the appearance of random cracks only. The laboratory findings were raised only at the trial. Forest submitted that that was a surprising, if not irregular, way to treat findings made and that there was no reason why the same should not be documented if they were valid. Whilst it would have been better for the laboratory findings to have been mentioned in the report, this does not mean that I should disregard the evidence entirely. As stated, I found Mr Wong to be a professional and reliable witness and in my view, the quibble raised by Forest could not detract from the essential truthfulness of the evidence.

143. Forest also raised objections to general inferences being derived from a small number of samples. I have already dealt with that. It then went on to submit that the conclusion was arrived at by a comparison of what Forest had applied with a control sample produced under ideal and perfect conditions. This, Forest submitted, was grossly unsatisfactory. I do not see much force in this submission. Forest was in effect saying that on site it is not possible to mix and apply plaster properly. Surely, this cannot be the case. It is always possible to follow the manufacturers instructions as to mixing if one is aware of them (which Forest was not) and as for application, the samples which Mr Wong examined were taken from the lowest storeys of the blocks and thus, Forest should have had no problem in properly applying the plaster to those areas. No hanging platforms or gondolas would have been required for such application. Thus, the conditions in which the applications were made would not have varied significantly from laboratory conditions.

144. Referring to the samples extracted from external areas, Forest noted that Mr Wongs evidence was that for plaster taken from areas without hollows, bonding between the plaster and the concrete substrate appeared good and well applied with few amounts of void along the plaster surface. Adhesion between the different layers of plaster also appeared good. From the samples extracted from debonded areas, there was a significant number of voids across the cross section of the plaster. Forest concluded that for areas where there was no debonding, the comments were favourable to it. Forest therefore submitted that it must be concluded that its workmanship was, on the whole, good. To say otherwise would lead to the anomalous conclusion that Forests workmanship was bad for debonded areas, but good for areas where the plaster did not debond. I do not follow the logic of that submission. In my view, a conclusion that Forests workmanship varied from good to bad is not ipso facto an anomalous one. It is the explanation why the debonding was not wholesale. If the condition of the concrete was the reason for the debonding, then one would have expected wholesale debonding as the concrete was the same throughout the project. The very fact that debonding took place at random is an indication that it was due to poor workmanship rather than the inherent condition of the substrate.

145. Forest had no control over the quality of the plasterers in that many of them were not direct employees of Forest but were furnished by labour sub-contractors. It does not seem to have insisted that all of these had proper qualifications since it could only produce documents establishing the plastering qualifications of about 15 workers. I was not very impressed either with the technical skills of the Forest supervisors. They appeared somewhat slap-dash and, for plastering work, to rely more on

experience than proper training. Mr Koon for example possessed a Skills Evaluation Certificate in Electrical Wiring and Lifting Supervisor Safety. He had no qualifications in the installation of block walls, brick walls, tiling or plastering works. Whilst he had had some experience previously in supervising plastering works, the Woodsvale development was the first time in which he had worked in a project which had a number of multi-storey blocks. Yet Mr Koon was the main supervisor.

146. As for Mr Kumar, he had had no formal training in plastering work but had supervised plastering and tiling works in more than five projects in Malaysia. His Malaysian projects had, however, involved shop-houses, factories and terrace houses, not high-rise blocks. In two of those projects, he had used a premix plastering cement that, according to the product brochure, could be mixed either by hand or in a drum. He did not read the Smartplas brochure. All he knew about mixing it is what Mr Koon had told him and Mr Koons instructions related only to the proportion of water to be used and not to the method of mixing. I was also amazed by the fact that Mr Shia could describe Mr Choo as a supervisor when it was clear that the latter had neither the experience nor the training nor the time to carry out any supervision of the plasterers.

147. Having considered the evidence as a whole, I am satisfied that the defects in the plastering work were the result of poor workmanship on the part of Forest. This being the case Forest had to rectify the defects on its own account and cannot claim any money for rectification work. Its claim for \$273,275 for such work mentioned in no. 54 is therefore disallowed.

(d) What damages can Nakano recover?

148. Nakano accepted that the conventional method of rectification of plaster defects was to hack out the defective plaster and then re-plaster the area properly. This method of rectification is also that prescribed by British Standards. In this case, however, Nakano did not resort to that method in order to rectify most of the defective plaster. Instead, it appointed Acolite to rectify the debonded plaster by using the pin injection method. Its claim against Forest for the sum of \$734,450 represents the total charged to it by Acolite (\$803,235) less the amount which it claimed from Acolite as backcharges (\$68,785).

149. Nakano argued that after terminating Forests employment, it had to complete the rectification and outstanding plaster works as soon as possible in order to avoid paying the owners of the project liquidated damages of \$35,000 per day. It argued that had it employed conventional plasterers, the rectification work would have taken much longer. Further, no third party sub-contractor was willing to quote for hacking and re-plastering of defective plaster works. In this respect, Nakano referred to efforts that it had made to obtain quotes from third party contractors and the fact that for those portions of the defective areas that were rectified by conventional means the rectification works were carried out by workers supplied by Yu Bee contractors on a daily-rated basis.

150. Forest on the other hand submitted that it had never agreed to the employment of Acolite as the rectifying contractor. Further, Nakano did not exercise any supervision or control over Acolites work. There was no control over the number of pins they put in and no proper explanation was ever given why small areas of debonding required the large number of pins inserted. No proper negotiations were carried out and Acolites quotation was accepted with question. Further, the original method statement by Acolite required nine pins per metre square. Subsequently, however, this was changed to 36 pins (at \$5 per pin) per metre square. Mr Hattoris explanation for the change was that it was required by the architect. Forest complained that the architect was not called to verify this nor was there any documentary evidence substantiating the explanation. I find Mr Hattoris explanation for the change in the number of pins credible. As Nakano had to pay Acolites bills first with no guarantee of being able to recover any part of the same from Forest, it would be eager to ensure that the pin injection costs would be as low as possible. Quadrupling the number of the pins and thereby quadrupling the costs cannot have been Nakanos idea. I am satisfied that it would not have done this without a positive direction from the architect.

151. Forest further submitted that it was completely unreasonable for Nakano to employ Acolite and incur rectification costs of \$803,235 for an area of approximately 4,462 m of plaster (calculated on the basis that with 36 pins being inserted per square metre, the cost per square metre was \$180) when Forest had charged \$810,106.25 (based on the original rate without inclusion of the charges for extra-thickness) for 64,828.5 m of external wall plastered.

152. In this respect, Forest as the party in breach of its contractual obligation to provide proper workmanship in the application of the plaster cannot insist on the rectification work being done in any particular manner and at any particular price. As long as Nakano had acted reasonably in taking the steps that it did to rectify the bad workmanship, Forest would have to pay for the same even though the cost is on the high side. In this case, the situation was that Forest was having difficulty doing both the rectification work and the plastering work. That was why Nakano brought Acolite in in the first place. Although Mr Shia says that he did not agree to Acolite being brought in, it seems clear that he did not seriously object to their participation until he received their third bill and found out just how expensive this method of rectification could be. At that stage, he wrote to Nakano telling them that he had then obtained sufficient labour to carry out rectification works and asking them to stop Acolites participation. Nakano acceded to his request for a few weeks but brought Acolite on site again when it was clear that Forest was lagging behind in the rectification works.

153. The evidence also established to my satisfaction that Nakano had difficulty in finding a conventional plasterer to carry out the rectification works after it terminated Forest. Its explanation for these difficulties was a reasonable and credible one. No one wanted the onerous and time consuming task of rectifying someone elses defects. In the end, it only managed to obtain plasterers from Yu Bee to rectify the defective internal plastering on a daily basis. The job had to be done quickly as Nakano was facing time pressure by reason of the looming deadline for completion of the project. It was therefore reasonable for Nakano to continue to employ Acolite on this job although their costs were high. On the question of cost, it must also be observed that in any case, Nakano would not have been able to employ plasterers to do the rectification work on the basis of any rate close to that originally charged by Forest. Forest itself charged differently for rectification work. Its bill for the rectification work it did was calculated on the basis of number of workers supplied over a four and a half month period and the cost of the materials. This bill came up to \$300,000. Yu Bees charges for its supply of daily rated plasterers also shows that it is expensive to employ plasterers to do conventional plastering when rectification work is involved.

154. In the circumstances, Nakano is entitled to recover from Forest the sum of \$734,450 which it paid to Acolite and I award it the same.

(3) Yu Bees invoices

155. Nakano sought to claim from Forest the amount of \$971,156.91 which it paid Yu Bee. In its submissions, it stated that it had had difficulty in engaging third party contractors to take over Forests incomplete works as well as rectification works. Yu Bee was only prepared to provide day workers to do plaster works under the supervision of Nakanos site supervisors. Nakano had no choice but to accept this offer although it meant that Nakano would end up assuming the risk of bad workmanship on the part of Yu Bees workers. Yu Bees workers were used primarily to rectify the defects in the plastering works and some touch up on the external defects.

156. Forest submitted that Nakanos total counterclaim for \$2,472,943.92 covering both defective and incomplete works had not been sufficiently broken down to disclose the basis of the various items constituting the counterclaim. In particular, the item of claim based on Yu Bees work cut across both categories but was expressed in the single amount of \$971,156.91, apparently for day works. In the end it was not clear whether Yu Bee and the other contractors were charging for work done to complete work left undone or to rectify defects.

157. I agree with the submission made by Forest that there are two distinct heads of counterclaim that Nakano must address, namely damages flowing from (a) the alleged failure to complete and (b) alleged defective work. This distinction is particularly important because I have found in Forests favour in relation to the termination for the alleged failure to complete whilst I have found in Nakanos favour in relation to defective works. Since I have found that Nakano should not have terminated Forests employment, it cannot recover the cost of employing other contractors to complete the work left undone at the time of such termination. It is, however, entitled to recover the cost of rectifying Forests defective works. As Forest further submitted, the onus is on Nakano to satisfy the court how much it incurred in respect of rectification work and that the overall amounts that it claimed were properly apportioned between the incomplete work and the rectification work.

158. Forest submitted that in relation to Yu Bee, Nakano had not properly apportioned the sum of \$971,156.91 between rectification works and completion of incomplete works. An analysis of Yu Bees bills made by Forest showed that the total amount comprised \$370,702.50 for external bricklaying, \$44,091.89 for bricklaying and \$556,437.51 for internal wall plastering. Looking at Yu Bees bills, I could not see how Forest was able to distinguish between the bricklaying and internal wall charges which together amounted to \$600,454.41. As the rectification of the external walls was done mainly by Acolite, I think the figure of \$370,702.50 must have related mostly, if not totally, to plastering of the incomplete areas by Yu Bees workers. Therefore, it cannot be claimed.

159. In relation to the remaining amount, it was the evidence of Mr Zuraimi that after Forest had been terminated he had inspected blocks 1 and 3 in order to identify hollows in the internal plastering. Thereafter, day workers supplied by Yu Bee worked under his supervision to rectify the defects in these blocks. The workers hacked and re-plastered hollow areas and also re-plastered the hacked areas left behind by Forest. They also made good uneven surfaces. The rectification works were tedious and took about five months to complete. In addition, according to Mr Ling, Yu Bees workers took over all the outstanding plastering of the internal walls. According to him, these were extensive. His listing of the outstanding work is set out in 87 above. It is impossible for me to apportion the sum of \$600,454.41 between the costs incurred for rectifying defective plaster and those incurred for completing outstanding work. If Nakano kept detailed records of what work Yu Bees workers did after January 2000, these were not shown to the court. Nor were Nakanos closing submissions helpful in this regard as there was no attempt there to break down the sum of \$971,156.91 into its constituent items or to give detailed justifications of the individual components. Accordingly, I cannot make any award in relation to Yu Bees invoices.

(4) Hai Hwas and Kan Leongs invoices

160. Hai Hwa and Kan Leong were the other two third party sub-contractors engaged to complete the outstanding external plastering works as well as to re-plaster areas that were hacked by Forest but left unplastered and to touch up uneven surfaces. According to Nakanos submission, Hai Hwa and Kan Leong claimed payment for about 28,000 m of external plastering works and the difference in their charges and what would have been charged by Forest amounted to \$85,327.89 and \$98,875 respectively.

161. In its submissions, Nakano did not distinguish between the amount that it paid to these two sub-contractors for rectification work and the amount that it paid them for completing the external plastering. As I have stated, Nakano is not entitled to recover any amount paid for completion work since it should not have terminated Forests employment. As there is no indication of the figures paid in respect of rectification work, I cannot make any award in favour of Nakano to compensate it for the rectification costs, if any, it paid to Hai Hwa and Kan Leong.

(5) Defective tiling works

162. Nakano submitted that there were defective works in the tiling sub-contract. By this sub-contract, Forest was supposed to carry out the tiling works in all 696 units in the project. In April 2000, however, Forests tiling works were terminated by Nakano because the works were defective and slow. At that time, Forest had completed tiling in only 72 units. Messrs Wong Kan Thong was engaged to take over the remaining units. At the same time, Forests tilers continued to rectify the defective works. As they were unable to complete the rectification work, Messrs Wong Kan Thong had to take those over as well and charged Nakano \$13,050 for the same. Nakano seeks to recover that sum from Forest.

163. The evidence of Mr Koon was that Forest had completed all its tiling work by June 1999. Thereafter, its workers did rectification work on the tiles as and when the defects were pointed out by Nakano. These rectification works were completed by December 1999 and Mr Koon stated that he had not received any further complaint about defective tiling work thereafter. Forest submitted that the evidence adduced by Nakano did not make it clear what kind of defects were found in Forests tiling

works or when these defects occurred. Nor was there any detailed evidence on the alleged rectification work.

164. I, too, find Nakanos submissions and evidence on this point to be perfunctory. I am unable to make a finding in its favour on this issue as it had not been proved.

(6) Rental of gondolas and climbing platforms

165. Nakano claims \$415,146.62 as the costs of additional rental of the gondolas and climbing platforms during the period between 15 December 1999 and 31 March 2000. Its case is that had Forest completed its external plastering works according to sequence and within schedule, Nakano would not have incurred these additional costs. Whilst Nakano conceded that there may be some overlap in the claim as the gondolas were also necessary for the painting works, it submitted that had it not been for Forests delay, it would not have been necessary for it to rent the gondolas and climbing platforms for the additional few months. It should be noted that according to Mr Hattoris affidavit, Nakano had to pay for rental of gondolas and climbing platforms right up to June 2000. Although the rectification works went on till June 2000 and the plastering works by Kan Leong were completed only at the end of May 2000, Nakanos claim was up to the end of March 2000 only to take into account that some platforms and gondolas were used for painting.

166. Forest submitted that there is absolutely no merit in this claim. The gondolas and working platforms were part of the general facilities provided by Nakano for the use of everyone on site. As Mr Hattori had admitted in cross-examination, these facilities were used by the other sub-contractors both before and after Forest had left the site. Forest further submitted that these facilities should be treated in the same way as the tower cranes and other hoisting facilities provided by Nakano. It did not occur to Mr Hattori that Nakano should claim against Forest for the costs of supplying these facilities even though the hoisting equipment was used by various sub-contractors after Forest had left the site.

167. This is another claim which has been insufficiently particularised by Nakano. The period covered by the claim is from December 1999 to March 2000 whilst the hiring platforms and gondolas were on site until June 2000. It is not clear whether these platforms and gondolas were at any time occupied exclusively by plasterers or whether during the whole of the period they were occupied by both plasterers and painters. A lot of the plaster work had been completed by the end of December 1999. Even if Nakanos estimate of 30% of external plaster work being incomplete at the time of Forests termination is accepted as accurate, that would mean that 70% of the plaster work had been completed and that a substantial amount of painting could be done. Nakano has recognised that it cannot claim hire for the gondolas and platforms during the times that they were occupied by painters. Seeing that there was overlap in the use of the equipment by painters and plasterers, it was up to Nakano to establish to my satisfaction how much of the costs it incurred in hiring the equipment could be attributed solely to the extended plaster works. It did not do this. It made a rough estimation that that the plaster works took about three and a half months out of the total six and a half months that it had to continue to hire the gondolas and climbing platforms. I am not able to award it damages on this basis.

(7) Fines and damages

168. Nakano is claiming the sum of \$16,000 in respect of fines which it imposed on Forest during the course of its works and which Forest had not yet paid. It submitted that all the sub-contractors working on the project had agreed to the system of fines and penalties. The purpose of these fines was to maintain a safe working environment. The rules and fines were agreed upon at Safety Committee meetings chaired by the safety officer and attended by the representatives of the various sub-contractors. Throughout the course of the project, Forest had been fined by Nakano of various acts of non-compliance with these rules. It had only objected on one occasion when it was fined for having illegal workers on site. After investigating Forests assertion that the illegal workers were not its employees, Nakano refunded the sum of \$3,500 to Forest.

169. Forest submitted that there was no legal basis to justify this claim. I agree. Simply being the main contractor does not give Nakano a right to fine its sub-contractors for breach of safety rules and other regulations which it might seek to enforce on site. The sub-contractor must agree to this situation. Alternatively, there must be a law permitting the imposition of fines in such circumstances. In this case, neither situation exists. There is no contractual term allowing Nakano to impose fines on Forest. This claim cannot be allowed either.

Conclusion

170. In respect of Forests claim, I have found that it is entitled to recover \$1,670,177.96 as the balance due in respect of the works performed by it and the sum of \$7,264.24 as damages for wrongful termination. As against this, I have found that Nakano is entitled to counterclaim the sum of \$734,450 in respect of the costs of rectifying the defective plaster works. This must be set-off against the amount of Forests claim. Forest is therefore entitled to \$942,992.20.

171. I therefore give judgment in favour of Forest in the sum of \$942,992.20 together with interest thereon at the rate of 6% per annum from the filing of the writ. As regards costs, although Forest has succeeded on its claim, it has lost on one major issue ie that relating to defective works and I think that there should be some adjustment in the costs order to reflect that. I will therefore hear the parties on costs.

Judith Prakash

Judge

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