Afro-Asia Shipping Company (Pte) Ltd v Da Zhong Investment Pte Ltd and Others [2003] SGHC 286

Case Number : Suit 352/2001

Decision Date : 21 November 2003

Tribunal/Court : High Court

Coram : Judith Prakash J

Counsel Name(s) : Manjit Singh and Sree Govind Menon (Manjit and Partners) for plaintiffs; Peter Madhavan, Zaheer Merchant, Basil Ong and Cheva Yu (Madhavan Partnership) for first to third defendants; Hong Heng Leong, Ng Wai Hong and Goh Wee Ling for fourth defendants; Edwin Lee (CTLC Law Corporation) for fifth defendants

Parties : Afro-Asia Shipping Company (Pte) Ltd — Da Zhong Investment Pte Ltd; Ong Hoo Kim Construction (Pte) Ltd; Falcon Piling Pte Ltd; Trevi Contrators (Singapore) Pte Lrd; Chin Kok Kwong Design & Build Pte Ltd

Damages – Assessment – Appropriate basis of assessment

Tort – Negligence – Breach of duty – Demolition and construction of building – Whether second and third defendants in breach of duty to take all necessary precautions to reduce impact of works on neighbouring properties

Tort – Negligence – Breach of duty – Duty of landowners to ensure sufficient alternative means of support for neighbouring properties before carrying out demolition and excavation works – Whether duty could be delegated – Whether first defendants breached duty

Tort – Negligence – Causation – Demolition and construction of building – Whether second and third defendants' works on neighbouring land caused damage to plaintiffs' building

Tort – Negligence – Res ipsa loquitur – Whether fourth defendants responsible for damaging plaintiffs' building – Whether ingredients of doctrine of res ipsa loquitur made out

Tort – Vicarious liability – Fifth defendants no longer in first defendants' employment when damage caused – Whether first defendants vicariously liable for damage caused by fifth defendants

Judgment reserved

Judith Prakash J:

Introduction

1 The plaintiffs, Afro-Asia Shipping Company (Private) Limited, are the owners of the premises at 63 Robinson Road known as Afro-Asia Building ('AA Building'). Up to March 1995, immediately to the left of AA Building along Robinson Road was a 6-storey building known as 57 Robinson Road. The first defendants, Da Zhong Investment Pte Ltd ('Da Zhong'), the owners of these premises, decided sometime in 1995 to redevelop the land. This decision set in train the events that led to this action. The parties involved in the ensuing construction activities at 57 Robinson Road were the second defendants, Ong Hoo Kim Construction (Pte) Ltd ('OHK'), the third defendants, Falcon Piling Pte Ltd ('Falcon'), the fourth defendants, Trevi Contractors (Singapore) Pte Ltd ('Trevi'), and the fifth defendants, Chin Kok Kwong Design & Build Pte Ltd ('CKK').

2 The redevelopment started in March 1995 with the demolition of the existing building by OHK. Following this, excavation and piling works were carried out in preparation for the construction of a 13-storey building. In 1997, however, the plans changed. First Capital Asia Land Pte Ltd

('FCAL') a company related to Da Zhong, acquired a leasehold interest in 55 Robinson Road, the plot of land immediately adjacent to the left boundary of 57 Robinson Road. Da Zhong then agreed to grant a lease of 98 years in respect of 57 Robinson Road to FCAL. The two plots of land were combined and FCAL proceeded to build a 20-storey building on them. From October 1997, further piling works took place on the combined plots and thereafter construction of the superstructure commenced. The building was eventually completed some time in 2000 and it is now known as Robinson Centre.

3 The plaintiffs complain that as a result of various construction activities at 57 Robinson Road, the AA Building suffered damage including cracks, soil settlement or subsidence, sinking of floors, tilting of the building and water seepage. Hence this action.

Summary of events leading up to the action

4 The involvement of the various defendants in the construction activities at 57 Robinson Road was as follows:

(1) Da Zhong made the decision for the redevelopment of the site, the demolition of the existing building and the construction of the 13-storey replacement. They employed OHK, Falcon and CKK.

(2) OHK was the demolition contractor engaged by Da Zhong to demolish the existing building. They were in control of the site from 15 March 1995 until 30 June 1995 when their demolition works were completed.

(3) Falcon was the piling contractor for the 13-storey building. They took over the site on 30 June 1995 and carried out piling works until 9 July 1996.

(4) CKK was the main contractor for the erection of the superstructure. They took over the site on 12 July 1996 to carry out the main building works. They stopped work after a few months due to the change in the plans.

(5) Trevi was employed by FCAL to do the piling work for the 20-storey building. They took over the new combined work site on 29 October 1997. The piling operations started about a month later and were completed on 26 June 1998.

(6) CKK was appointed by FCAL to build the 20-storey building and the combined site was handed over to them for this purpose on 12 August 1998.

5 A short description of the original construction site may be helpful. The front of the site faced Robinson Road. On the left was AA Building which was bounded by Robinson Road in front and McCallum Street on the left. On the right of the site was a 3-storey pre-war shophouse known as 55 Robinson Road. At the rear was a back lane, Boon Tat Link, which ran behind all three premises until it joined McCallum Street. On the other side of the back lane there was a multi-storey office building called Shing Kwan House that faced Shenton Way. Subsequently, the original site was enlarged by the incorporation of 55 Robinson Road. It must also be stated that Shing Kwan House was demolished in about 1998 and work then started on a new building on that site. In the course of the proceedings this second construction site was referred to as 'the Kajima site' after the name of the main contractor for that project.

6 The AA Building comprises two structures: a 7-storey building and a 4-storey annex. The 7-storey building was constructed in the 1950s as an L-shaped building with frontages on Robinson Road

and McCallum Street. It is of reinforced-concrete frame construction and was built on piled foundations. In about 1956, a single storey building which became an electrical sub-station was constructed at the rear corner of the 7-storey building. This sub-station was used first by the Public Utilities Board and thereafter by PowerGrid Ltd. The 4-storey annex was apparently constructed in two phases. The first phase comprised the first (ground) and second floors, apparently built in 1969/70. The third and fourth floors were built about two years later. The first phase extended over the sub-station, which was increased in width, and also over the second storey terrace at the back of the 7-storey building. The roof slab of the sub-station became part of the second storey floor of the extension. In the second phase, the annex was increased to four storeys with an additional reinforced concrete floor and a steel roof structure with metal roofing. The annex was supported off the original piled structure, the piled roof terrace columns on new piled foundations along Boon Tat Link and also off the sub-station. The sub-station itself did not have a piled foundation.

Events in 1995

7 In February 1995, Messrs Graham Miller (Singapore) Pte Ltd ('Graham Miller') conducted a photographic survey of AA Building and 55 Robinson Road in order to ascertain the then existing condition of these two buildings. This survey was carried out in anticipation of the demolition and construction work to be carried out on Da Zhong's land. On 15 March, the site was handed over to OHK in order that they could commence demolition of the existing building. Work started shortly thereafter.

8 The work had an almost immediate effect on AA Building. From 28 March onwards, the plaintiffs complained both verbally and in writing of defects caused to their building by the works. The complaints were of noise and vibration felt by tenants and other persons in AA Building, of cracks appearing in parts of the building and also of water seepage. By then the demolition had reached the stage of exposing the wall of AA Building that was adjacent to Da Zhong's building.

9 On 12 April, a meeting was held at AA Building in respect of the plaintiffs' complaints. Among those present were representatives of the plaintiffs, of OHK, of Graham Miller and of Da Zhong. The meeting was held to check and record the list of defects that had appeared in AA Building. Graham Miller subsequently prepared a report dated 19 April which listed the defects found.

10 On 27 April, the plaintiffs complained that OHK had knocked through part of the wall of AA Building between the 6th and 7th storeys at the front lift lobby area. Da Zhong instructed their consultant engineers, DE Consultants Pte Ltd ('DE Consultants') to look into this complaint. After investigation, DE Consultants informed Da Zhong that there was no boundary brickwall between the plaintiffs' building and 57 Robinson Road from the 6th floor downwards. In fact only a master board separated the two buildings. They also discovered that the clip-lock roof at the 4th storey of AA Building was secured to their boundary wall (which was due for demolition) instead of being supported by independent supports from AA Building. The plaintiffs informed Da Zhong that they were taking steps to deal with these matters but also kept on asking Da Zhong what remedial measures they were taking in respect of the damage that their works had caused to AA Building.

11 In June, the plaintiffs put on record that the floor of unit #04-03 seemed to have sunk since the demolition work started and that fresh hairline cracks had been seen in the ceiling of the unit directly below that floor. Further, the marble slabs of the building column fronting Robinson Road had been damaged the previous weekend and strong vibrations were being felt by the tenants whilst the demolition works were on going. The next month, the plaintiffs renewed their complaints about possible water seepage damage.

12 In July, the architect instructed OHK to undertake certain repairs to AA Building. These included rectifying cracks found in the building, filling up holes on the wall and repairing some damaged rainwater pipes. OHK did not do the work and Da Zhong eventually appointed another contractor to carry it out. The cost of this repair (some $4,500) was deducted from the contract sum due to OHK.

13 On 30 June, Falcon took over the site from OHK. Before starting their piling work which was going to take place in close proximity not only to the neighbouring buildings but also to the MRT tunnel below Robinson Road, Falcon arranged for a pre-condition survey to be carried out on the surrounding buildings and areas by Thomas Howell Group (Singapore) Pte Ltd ('Thomas Howell'). Thomas Howell issued their survey report in August.

14 Falcon commenced their piling works from the rear of the work site and at the area next to the sub-station in AA Building. On 4 August which was the day on which the first pile was being installed, Da Zhong received a letter from the plaintiffs advising them that new cracks had appeared in AA Building as a result of commencement of piling works. Also, other cracks had deteriorated quite significantly. The plaintiffs asked Da Zhong to instruct Falcon to stop work immediately. A site inspection was then made by both Falcon and DE Consultants. On 5 and 7 August, joint inspections were conducted by Falcon, Thomas Howell and the plaintiffs' representatives. Thomas Howell subsequently issued an addendum to their survey report.

15 Piling work resumed on 8 August. On 25 August, the plaintiffs wrote to put on record that strong vibrations had been felt that afternoon. Also, further cracks had been found on walls and columns and existing wall cracks had deteriorated. They also stated that their tenants had expressed great concern as to whether there was any impending danger from the piling works. Three days later the plaintiffs complained of new cracks emerging in other parts of their building.

16 Da Zhong was concerned. They requested DE Consultants to investigate the matter and to obtain advice from a professional engineer on these cracks and on the remedial steps to be taken. In order to ensure that nothing further was done to aggravate the situation, DE Consultants decided that all work on site be stopped. They issued a stop work order to Falcon on 29 August.

17 Falcon appointed WP Brown Singapore, a firm of consulting structural and civil engineers, to advise them on remedial measures and Da Zhong appointed another engineering firm, AGS Consult, for the same purpose. In order to determine the nature of the foundation of the AA Building at the sub-station area, a minor excavation was done by Falcon on 30 August. It was discovered that there was no piled foundation under the sub-station. The sub-station was, instead, sitting on a footing on top of which was a strut and then a ground beam. It was also discovered that the ground beam and the footing were cracked.

18 On 5 September, WP Brown recommended that the first remedial measure to strengthen this foundation and to prevent further movement of the sub-station was to immediately grout the footing with concrete. Da Zhong instructed Falcon to carry out this work immediately and also to grout the cracks in the back lane façade and columns and the stumps along the boundary wall. On 7 September Da Zhong notified the plaintiffs of the work that had been done.

19 Further investigations were carried out into the foundations of AA Building and it was discovered that all of the annex was constructed on pre-cast concrete piles except for that small portion which rested on the sub-station which itself was supported on a raft foundation. At Da Zhong's request, Dr KK Soh of AGS Consult proposed remedial measures which would provide support for this part of AA Building. The plaintiffs and their engineering advisers, a company called Meinhardt (Singapore) Pte Ltd ('Meinhardt'), were informed by DE Consultants of the measures proposed by Dr

Soh at a meeting that took place on 30 October. Da Zhong decided to implement the measures. Work on them commenced on 28 November 1995 and was completed in mid March 1996. In the course of the work, scaffolds were erected inside the sub-station to hold up the interior. Further, some repairs were carried out in AA Building by Falcon.

Events in 1996

20 Falcon recommenced their piling works on 16 March and completed installation of the last pile on 24 June. After the piling works restarted, the plaintiffs made oral complaints about cracks to Da Zhong's clerk-of-works. These were then conveyed to Falcon.

21 Falcon demobilised from the site on 9 July. On 12 July, the site was officially handed over to CKK to start work on erection of the new building. CKK appointed Insight Adjusters & Surveyors Pte Ltd ('Insight') to carry out a pre-condition survey on the surrounding buildings. These surveys were conducted in March and July and three survey reports dated 21 March, 24 July and 14 August were issued by Insight.

22 In view of the problems previously experienced with AA Building, CKK proceeded to install sheet piles in the site in order to divide 57 Robinson Road into three sections length-wise. A grout mix was then injected into the soil in the section nearest to AA Building to strengthen it. The purpose of having the grout mix was to harden the soil and consolidate it before excavation work took place. This was done to eliminate any vibration or soil movements that might cause damage to AA Building. Thereafter, CKK started excavation works for the purposes of cutting the piles in the section next to AA Building.

23 On 22 August, the plaintiffs complained that more cracks had appeared in their office on the second level of AA Building, that there was water seepage on the third level and that there were still visible cracks on the third and fourth levels. New cracks had also recently appeared on units in those levels. The plaintiffs continued to make complaints about water leaking into AA Building throughout September and October. In October they also complained that cracks were widening.

24 On 16 December a joint inspection was held at AA Building attended by Da Zhong, DE Consultants, Falcon and the plaintiffs. The purpose of this inspection was to finalise the list of cracks and remedial works to be done by Falcon. Thereafter, Falcon carried out some repair works and these were completed by January 1997. It was Falcon's view at that stage that they had no further responsibility for damage to AA Building.

Events in 1997

25 All work on the 13-storey building was officially stopped on 1 January 1997. From then until early October no work or construction activities were carried out at the site. This was because FCAL had acquired 55 Robinson Road and decided that the plots of land at 55 and 57 Robinson Road would be combined. This would enable the developer to build a bigger and taller building. The developer of the new building would be FCAL. FCAL proceeded to appoint Trevi as their piling contractors and to reappoint OHK as the main contractors for the construction of the 20-storey building. The enlarged work site was physically taken over by FCAL from about 29 October which was the date when Trevi occupied the site to do piling works. Trevi commenced their piling operations after 27 November 1997.

26 On the plaintiffs' part, they continued throughout 1997 to complain about defects and about inadequate rectification works. They also complained that they were losing rental income as improper

rectification of affected units meant they were unable to lease out the same. In early 1997 PowerGrid informed the plaintiffs that it would like to upgrade the electrical equipment in the sub-station. It brought to the plaintiffs' attention various defects it had found in the sub-station which it required to be rectified. Among these was the fact that the sub-station floor had tilted. From subsequent correspondence, it also became apparent that the upgrading works would require the temporary removal of the supporting scaffolding erected inside the sub-station by Falcon. The plaintiffs had to arrange this. The plaintiffs also had to do other rectification works in the sub-station and they notified Da Zhong that they would claim the cost of such works from the latter.

Events in 1998 and thereafter

27 At the beginning of February 1998, the plaintiffs sent Da Zhong's lawyer a list of defects found in AA Building and requested that these be rectified. Following this, a joint inspection took place on 25 March attended by the plaintiffs, Da Zhong, DE Consultants and Dr Soh.

28 At the beginning of the year, the rectification works in the sub-station commenced. These were completed a few months later. During the course of the works, the internal scaffolding erected by Falcon was removed to allow PowerGrid's contractors to install the new equipment. Thereafter, the scaffolding was reinstated. In August, the plaintiffs made a demand on Da Zhong for payment of the cost of rectifying the defects in the sub-station which amounted to $40,966.50. No payment was made.

29 Trevi completed piling works on 26 June. The enlarged site was handed over to OHK again on 12 August for them to commence construction of the 20-storey building. OHK commenced excavation work on or around 1 September 1998 and the main building works continued until the temporary occupation permit was obtained on 1 November 2000. During this period of time, there were still complaints from the plaintiffs about damage to AA Building.

The action

30 This action was commenced in March 2001. The statement of claim shows that the plaintiffs' claim is based on breach of duty, negligence and nuisance. Most of the allegations are made against all of the defendants without distinguishing between them and specifying the nature of the duty each of them owed the plaintiffs. Some specific allegations are made, however.

31 In respect of Da Zhong, the specific allegations are:

(1) that they were under a strict duty to support AA Building and the land on which the same stands;

(2) that extensive damage was caused to AA Building by Da Zhong's breach of their duty to support AA Building and their failure to:

> (a) take all necessary steps to avoid damage to AA Building when Da Zhong withdrew the support long existing to AA Building;
>
> (b) to provide a sufficient means of support to AA Building before withdrawing the existing support;
>
> (c) take notice of the plaintiffs' complaints of damage to AA Building, thereby aggravating the damage; and

(d) take all necessary steps to rectify the damage and/or to provide adequate remedial support to AA Building.

32 The other allegations in the statement of claim were made against all the defendants. These were:

(1) that the defendants owed a duty of care to the plaintiffs to ensure that adequate measures were adopted to ensure that AA Building would not be damaged or affected during the course of the demolition and/or construction activities on the site;

(2) during the course of the demolition and construction activities ('the works'), the defendants wrongfully permitted and caused:

(a) extensive damage to AA Building;

(b) further damage to AA Building in that external supports raised by Da Zhong remain attached to AA Building even after the completion of the works and that this constituted trespass;

(c) further damage in that concrete core samples remained on AA Building after completion of the works and that this constituted trespass;

(d) further damage in that excessive construction noise and vibrations affected AA Building and resulted in tenants predetermining tenancies and not renewing tenancies and in preventing new tenants from taking up tenancies.

(3) that the damage to AA Building was caused by negligence on the part of the defendants who:

(a) failed to exercise reasonable care to ensure the works would not damage AA Building or the land on which it stood;

(b) failed to take precautions to ensure that the works would not cause falling debris to damage the plaintiffs' premises;

(c) caused or permitted the works to be carried out in an unsafe and dangerous manner;

(d) caused or permitted the foundation of AA Building to be disturbed through soil movement, settlement and vibrations during the works;

(e) caused or permitted the ground adjacent to AA Building to settle during the excavation;

(f) failed to employ methods to minimise disturbance to the soil on which AA Building stood or to prevent the ground adjacent to AA Building from being disturbed or settling;

(g) failed to carry out adequate shoring work immediately after the excavation to prevent ground movement and settlement;

(h) failed to pay sufficient attention to the plaintiffs' request to stop work thereby aggravating the damage to AA Building.

(4) that the construction noise and vibrations that affected AA Building and its tenantability were caused by the defendants' negligence and/or breach of duty of care on part of each of them in that they caused such vibrations and noise to arise from the works and failed to take precautions or adopt such methods of excavation and piling driving which would have avoided causing vibrations and construction noise;

(5) the activities of the defendants constituted nuisances against the plaintiffs;

(6) in the alternative, the plaintiffs relied on the doctrine of *res ipsa loquitur* and averred that the damage and loss would not have been caused to AA Building except for the works commissioned by Da Zhong and undertaken by the other defendants.

33 The plaintiffs included particulars of the special damage that they had suffered as a result of having to engage services of the experts to conduct inspections of AA Building and to verify the extent of the damage

34 The statement of claim ended with the plaintiffs claiming the following main reliefs:

(1) damages to be assessed including damages for the continuing trespass;

(2) special damages;

(3) an injunction compelling the defendants to remove all the external supports on and against AA Building and all core samples from the building.

35 I should note at this stage that the way in which the plaintiffs' case was pleaded resulted in Da Zhong having to answer all of the allegations made and in the other defendants having to answer almost all of the allegations made. This resulted in lengthy cross-examination and a prolongation of the trial which could have been avoided had the plaintiffs been more specific in their accusations.

36 Da Zhong, OHK and Falcon appointed the same solicitors and filed a joint defence. It contained the following main points:

(1) that as the sub-station was controlled by PowerGrid and its predecessor, the PUB, the plaintiffs could not assert full rights over the sub-station and these belonged to PUB which was not a party to the action;

(2) the annex over the sub-station was illegal and the plaintiffs ought to have known that its construction could cause damage to it in the event any development took place in the vicinity of AA Building and alternatively, that the annex was constructed negligently;

(3) from 3 October 1997 when Trevi was appointed by FCAL, alternatively from 27 November 1997 when Trevi started its piling works and alternatively from 19 March 1998 which was the date on which the lease of 57 Robinson Road to FCAL commenced, the first to third defendants were not and could not be responsible for any damage occasioned to AA Building;

(4) whilst accepting that there was a right of support owing to AA Building and the sub-station, Da Zhong pleaded that that right was duly observed and never breached by them and Da Zhong and

the other two defendants also pleaded that they had provided and/or taken reasonable steps to provide AA Building with the necessary support;

(5) Da Zhong averred that once they granted the lease to Falcon they ceased to owe any duty of support to AA Building;

(6) alternatively, all three defendants averred that they had taken all reasonable and necessary measures to ensure that AA Building and the sub-station would not be damaged by their works;

(7) the defects and damage allegedly caused to AA Building were pre-existing defects and damage which existed before any works were commenced on the site;

(8) alternatively, the defects and damage allegedly caused to AA Building were rectified and repaired thereby placing the premises in a good or reasonable condition without the plaintiffs suffering any damage;

(9) the plaintiffs agreed to the erection of the external supports and therefore such supports cannot amount to trespass;

(10) the core samples were not left in AA Building by the first to third defendants; and

(11) the plaintiffs had caused or contributed to the damage they had suffered by erecting an unauthorised annex and erecting it when there was no proper foundation below the sub-station and by failing to provide a proper foundation for the sub-station.

37 The defence filed on behalf of Trevi was much shorter. They averred that they were only appointed as piling contractors for the site in mid October 1997 and were not responsible for any occurrence which took place before October 1997 or which did not fall within the scope of their work at the site. The plaintiffs were put to strict proof that Trevi's works had caused damage to AA Building. They also denied that the plaintiffs had suffered the loss and damage alleged.

38 CKK also filed a short defence. They denied being the agents or employees of Da Zhong save for a brief period of about three months starting in July 1996. They did not admit carrying out extensive demolition, excavation, piling and construction works as agents of Da Zhong. They denied that their works on site had caused any damage to the plaintiffs and put them to strict proof both as to causation and as to date of the alleged damage.

39 The trial was lengthy. Experts were called by the plaintiffs and the first to third defendants to support their respective positions. For ease of understanding the discussion that follows, these persons were:

(1) Dr Richard Stewart Pugh, a chartered engineer who specialises in geotechnical engineering. Dr Pugh was called by the plaintiffs as an expert witness to consider and prepare a report on the cause of the subsidence and the damage sustained by AA Building;

(2) Mr Crispin Casimir, a chartered building surveyor who was engaged by the plaintiffs to survey and prepare a report on the damage sustained by AA Building. He provided his costing of the works necessary to rectify such defects and damage. He also provided a costing for the demolition and total reconstruction of the annex; and

(3) Mr Kenneth James Patterson-Kane, a civil engineer who was engaged by the first to third

defendants to do the following:

(a) carry out a visual inspection of the damage to AA Building;

(b) to examine documents relating to such damage and the works on the site;

(c) to assess and report on the extent of damage to AA Building and to differentiate between damage caused by the demolition, excavation and construction work at the site and damage due to other causes; and

(d) to identify and report on which of the damage to the building caused by the work at 57 Robinson Road was caused by works carried out up to 1 January 2001 and which was caused by works after that date.

Dr Soh Kok Kee, the civil engineer who was consulted by Da Zhong to advise on remedial methods to preserve the stability of AA Building, also gave evidence. Technically, he would not be regarded as an expert witness as he was involved in the events that occurred. However, in view of his qualifications and experience, his opinions on the technical matters he was involved in would be relevant and merit consideration by the Court.

The plaintiffs' case against the first, second and third defendants

(i) Condition of AA Building before construction work started

40 The plaintiffs relied on the contents of the Graham Miller report dated 8 February 1995 to establish the condition of AA Building prior to the commencement of the construction activities at 57 Robinson Road. The surveys culminating in this report took place over a period of three days and both the interior and the exterior of the building were surveyed. The surveyor photographed the areas of dilapidation and described their nature in his report. A second survey was carried out by Graham Miller on 12 April 1995 of five locations where the plaintiffs had reported damage to have occurred during demolition works.

41 I will now set out the contents of the first Graham Miller report in some detail as this will help delineate the disputed points. Both experts (Dr Pugh for the plaintiffs and Mr Paterson-Kane for the first three defendants) accepted that this report provides the primary documentation of existing defects and damage to the AA Building prior to the commencement of work.

42 The report noted that the ground floor and second storey of AA Building showed no signs of any significant distress. The front lift lobby and the rear service lobby were said to be in sound condition. On the third storey, fine cracks (less than 1mm) were noted on the wall. On the fourth storey, five observations were made. First, there were stains on the false ceiling boards at the rear door of unit 04-07. Secondly, 'an extensive fine diagonal crack' was sighted on the wall next to the front door of that unit. Thirdly, another fine crack was observed on the opposite wall. Fourthly, there was a fine crack near the ceiling of the corridor. Finally, an extensive fine diagonal crack was cited on the wall of an unused motor room. The surveyor found the fifth storey and the roof cladding over the fourth storey annex to be in sound condition. There was, however, an extensive area of staining at the construction joint at the rear of the building. On the sixth storey, there were only two observations. The first was a wide crack along the construction joint of the building and the second was that leaching stains were observed on the surface of the covered column near the rear window of unit 06-09. On the seventh storey, no signs of significant distress were sighted along the corridor. Localised seepage stains on the false ceiling board of the lobby were noted. In unit 07-05,

a wide separation gap of signs of severe water seepage was observed along the construction joint. In the men's toilet, fine cracks were sighted on the wall.

43 As regards the exterior, the surveyor noted that there were multiple fine cracks near the abutment joint of the rear elevation. Above the sub-station, at the wall between the second and third storeys, multiple fine cracks were observed. These were also seen on the side wall at the entrance of the rear lift lobby. A fine separation gap was observed along the junction of the cladded wall and the apron and fine gaps were seen in the coursing of the wall tiles. Save for the aforesaid, it was recorded that 'no other signs of significant defects were noted at the rear'. On the side elevation, the wall façade from the second storey to the seventh storey appeared to be in sound condition. Typical fine separation gaps were observed along the junction joints and there were cracks in several of the wall tiles outside the MPH Bookstore. On the front elevation at the ground floor, there were a crack in the wall cladding below the MPH signboard and some stains amongst intermittent fine cracks at the overhead canopy. On the wall façade from the second to the seventh storeys, apart from weathering stains with localised fine cracks, no other signs of significant distress were apparent. No remark was made on the condition of the annex roof. In respect of the roof of the seventh storey building, water ponding and patching of the waterproofing membrane were evident. Multiple fine cracks were observed at the parapet coping and in various other areas. Along the central construction joint of the building, wide cracks were noted, with previous patching, on the parapet facing the back lane. Within one lift motor room there were fine cracks with seepage stains on the walls and ceilings and in another lift motor room, there were multiple fine random cracks on the walls. There were multiple fine cracks to some portions, fine hairline cracks on the wall in lift motor room, some wide cracks along the central construction joints with signs of previous patching undertaken, extensive fine horizontal cracks on the wall near the water tank, some spalling of the external wall and some fine cracks.

44 The opinion of Dr Pugh was that the annex did not have a fully piled foundation but was supported partly off the 7-storey building, partly off piled foundations and, at its eastern corner, off the concrete raft foundation of the sub-station. Because of the mixed nature of the foundation, a degree of differential settlement and load redistribution took place within the annex as a result of consolidation settlement of the marine alluvium underlying the loose granular made ground on which the sub-station was founded. Dr Pugh stated that at the time of the first Graham Miller report, settlement of the 4-storey annex would have been substantially complete but external evidence of past differential foundation movement between the sub-station and the annex manifested itself in the form of the fine cracks on the rear façade facing Boon Tat Link found by the surveyor. Internally, the survey revealed little in the way of crack damage and the annex was virtually free of such defects. There were no slopes observed on the floors and the building as a whole appeared to be in sound condition.

45 Mr Patterson-Kane's opinion was that the cracking in the back lane façade shown in the photographs in the first Graham Miller report was caused by significant differential settlements. He considered that this suggested that the annex as a whole could have had shallow foundations rather than the mixed foundations which Dr Pugh considered likely based on the statement made by the engineer who was responsible for the construction of the annex. In his view, the foundation of the sub-station did not have sufficient structural or bearing capacity to support the load from the annex. He later stated that the damage which resulted from the construction works might not have occurred, or would have been greatly reduced in its extent and severity, if the annex had been provided with competent foundations.

46 Dr Pugh did not agree with Mr Patterson-Kane's criticisms of the foundation of the sub-station. He pointed out that there was no evidence that the sub-station foundation had failed to

perform its function in the 15 years or so that it supported the sub-station alone or in the following 25 years or so during which it had supported the 4-storey annex as well.

47 Having considered all the evidence and the comments made by Dr Pugh on Mr Patterson-Kane's opinion as well as Mr Patterson-Kane's comments on Dr Pugh's opinion, I find Dr Pugh's views to be more coherent, logical and in accordance with the facts established by the various surveys of AA Building and the documents relating to its construction. I find therefore, that, as at February 1995, AA Building was in sound and stable condition. Such defects as existed were due to wear and tear and differential settlement which had stabilised. There were also some defects due to lack of maintenance. None of the defects or damage noted at the time adversely affected the stability of the building. The first Graham Miller report establishes the condition of the building at that time. It was commissioned by First Capital Insurance Ltd, another member of the group that included Da Zhong and FCAL. Da Zhong's project manager, Mr Goh Chue Chua, agreed in court that Da Zhong and their architects had accepted the first Graham Miller report. He regarded that survey report as being commissioned by Da Zhong and stated that Da Zhong's position was that they were not responsible for any cracks recorded in that report since the cracks had occurred before Da Zhong's construction activities commenced. He further agreed that he had seen all of the survey reports produced after the first Graham Miller report as listed in Mr Patterson-Kane's expert report except for two reports from STIMC Protection Associates and that Da Zhong was not challenging the contents of any of the reports that he had seen. It is significant in this respect that Da Zhong, Falcon and OHK conducted a joint defence and none of them introduced any evidence to challenge the truth of the survey reports which they had agreed should be included in the agreed bundle without the necessity for formal proof.

48 The first Graham Miller report was important for another reason. As stated above, the experts agreed that the cracks found in the façade of the annex facing Boon Tat Link indicated that there had been differential settlement. Mr Patterson-Kane opined that the parties involved in the development at 57 Robinson Road should have noted from this existing cracking that the foundations of the annex were inadequate to prevent settlement related damage and that they should have taken this into account in selecting construction methods. He qualified this opinion by stating that he would not have expected the developing parties to have anticipated the degree of inadequacy of the foundations in this area. Dr Pugh agreed that the evidence of this survey was sufficient to have alerted those responsible for the adjacent development that the damage to the annex was not compatible with a building on fully piled foundations.

(ii) Damage caused to AA Building

49 One line of defence put forward was that the plaintiffs had ignored the effect on their building of the construction undertaken at the Kajima site. The first three defendants asserted that the excavation at the Kajima site which started in late 1998 was significantly deeper and bigger than that undertaken at 57 Robinson Road. Quite apart from the fact that no direct evidence was led on the dimensions of the Kajima site excavation, I do not consider that excavation relevant to the causes of the damage sustained by AA Building prior to 1998. It is not relevant to liability for such damage.

50 There is no doubt that OHK's demolition works did cause damage to AA Building. The evidence of this is not only in the contemporaneous letters of the parties but also in survey reports. Graham Miller carried out a second survey in April 1995 after OHK had started work. Their inspection on 12 April 1995 was of five locations where the plaintiffs had reported damage to have occurred during demolition. The observed damage was, in the main, cracking within both parts of the AA Building adjacent to the demolition site. Subsequently, after OHK had stopped work and before Falcon started piling, Thomas Howell carried out a survey of the lift/stair area of the section of the 7-

storey building immediately adjacent to the construction site together with the exterior of the entire building. This survey revealed widespread cracking to internal finishes including floor and wall tiles. Externally, there was cracking to the tiling on the front entrance façade and wider cracks in the rear exterior façade. The most serious matter complained of by the plaintiffs was the subsidence of a portion of the floor in unit 04-03 that occurred in June 1995. This unit abutted the work site and the subsidence was observed by Da Zhong's professional engineer. Whilst the report issued by Thomas Howell did not specifically mention the subsidence, it pointed out that the floors of the lift lobbies on the third and fourth storeys were uneven. Mr Ong Hoo Kim, the eponymous director of OHK, did not accept that the damage and defects recorded in the second Graham Miller report and in the Thomas Howell report of 17 August 1995 were caused by OHK's work. He did, however, agree that he attended inspections of cracks in AA Building on 4 April 1995 and 12 April 1995, that he was aware of the water seepage problem in unit 03-11 in May 1995 (though he attributed that to pre-existing damage) and that he was aware that OHK was responsible for some of the damage sustained by AA Building which was why they carried out certain repairs and permitted Da Zhong to deduct a small amount from their contract sum to cover the cost of repairing such defects.

51 On the evidence (oral, documentary and expert) there is no doubt either that additional damage was inflicted on AA Building by the piling work carried out by Falcon after OHK had finished its demolition activities. The piling activities had an immediate adverse effect on the stability of AA Building and this resulted in the work being stopped while investigations were made and methods of stabilising the building were looked into. The details of the damage inflicted can also be seen on damage charts prepared by Dr Pugh based on data from a second survey report issued by Thomas Howell in August 1995 and a survey report issued by Insight Adjusters in July 1996. As Dr Pugh noted, the second Thomas Howell report 'revealed previously unrecorded, widespread damage within the sub-station at ground floor level and in Afro-Asia's offices on the first floor immediately above, extending also to the second and third storeys of the 4-storey building'. Instrumentation data supplied by the defendants subsequently indicated that between 10 August 1995 and the cessation of piling on 29 August 1995 the AA Building underwent up to 25 mm of settlement. Further subsidence took place between 29 August and 16 October 1995 and this was plotted on a graph prepared by Dr Pugh. Mr Patterson-Kane considered that there had been settlement at the sub-station during the period from 10 August to 16 October 1995 and that on 28 August 1995, there had been settlement of 24 mm. Thereafter, settlement had fluctuated slightly before remaining fairly steady at 25 to 26 mm from 11 September to 16 October 1995. In his opinion, it was clear that the piling works were a cause of the settlement of the sub-station and of resulting settlement related damage to the sub-station, the parts of the building directly above the sub-station and immediately adjacent parts of the building.

52 In their joint submissions, the first three defendants admit that some damage was caused during OHK's and Falcon's works but do not agree with the extent of damage asserted by the plaintiffs or its cause. They rely on the Patterson-Kane report to support their submissions that the damage during demolition works was more minor than the plaintiffs alleged. Whilst they admit that there was settlement damage by reason of the piling works, they lay the blame for this on the allegedly inadequate foundations of the sub-station. In this connection, they also rely on the evidence of Dr Soh who investigated the cause of settlement at AA Building. He stated that trial excavations conducted after the piling works was stopped showed that the foundation of the sub-station comprised masonry footings with no steel reinforcement. Dr Soh considered the sub-station to have what is called a 'raft foundation'. His view was that the structural strength of the raft had not been adequately designed to support the sub-station. However, the sub-station did not collapse before the defendants' works started because the raft had been supported by cantilever action from adjacent beams and at the same time the whole sub-station leaned onto 57 Robinson Road. In Dr Soh's opinion, the withdrawal of the support of 57 Robinson Road and the piling work caused the

cantilever action to come to a new equilibrium. If there had been no construction activities at the site, the hairline cracks which existed in the sub-station may have become worse over time but only marginally. The immediate cause of the serious cracks observed in the sub-station in August 1995 was the removal of the structure at 57 Robinson Road and the construction activities conducted there. The fundamental cause was, in Dr Soh's opinion, the grossly inadequate foundation.

53 Whatever Dr Soh's views may be as to the inadequacy of the foundations of the sub-station, the fact remains that until construction activities started at 57 Robinson Road, AA Building including the sub-station was in a sound condition. As Dr Pugh pointed out, the sub-station had borne the weight of the 4-storey annex for some 25 years. There had been some differential settlement after the annex was constructed on top of the sub-station but this settlement had, as evidenced by the first Graham Miller report, stabilised before the works started. Dr Soh himself agreed that if no construction work had taken place there would have been only marginal worsening of the hairline cracks in the sub-station. The construction activities interfered with and disrupted the existing stable position. Whilst the sub-station did not have a piled foundation this did not mean that the foundation was grossly inadequate. The foundation was adequate for the original one-storey sub-station. What perhaps transformed adequacy into inadequacy was the construction of part of the annex over the sub-station. Dr Pugh, however, whilst agreeing that he would not have designed the foundations for the annex in the way they were designed, considered that it was reasonable for the engineer to provide for the annex to have mixed foundations including support from the sub-station and that the design had proved its adequacy in practice. I accept that evidence.

54 The immediate cause of the damage was the work done by OHK and Falcon. This alone does not establish liability. The plaintiffs' case is that the first three defendants are liable in negligence because they:

(a) failed to underpin or provide temporary supports of any or any sufficient nature to counteract the removal of the natural support to the plaintiffs' land and AA Building; and

(b) demolished, excavated and constructed in close proximity to AA Building when they knew or should have known that such construction activities could cause damage including a collapse or subsidence of the plaintiffs' land and building.

Falcon and OHK are responsible because they carried out their work negligently. As against Da Zhong, the plaintiffs also put their case on the basis of strict liability. They say Da Zhong owed a strict duty of support to AA Building and once this support was removed by OHK, Da Zhong was responsible for the consequences.

55 Before construction work started, Da Zhong commissioned soil tests at 57 Robinson Road. The borelog sample taken showed that the first five layers of the soil comprised, in descending order, 0.8m of concrete and hardcore, 2.9m of stiff silty clay with gravel, 13.8m of soft marine clay, 5.5m of stiff silty clay, 3m of firm marine clay. The bore hole location was near the back lane and close to AA Building. The soil beneath AA Building would have been similar since, as Mr Patterson-Kane agreed, the borelog showed soil conditions that were reasonably typical of the area. He also emphasised the presence of the 13.8m thick layer of soft compressible upper marine clay which as he stated had low shear strength and bearing capacity and would undergo high consolidation if significant vertical loads were applied leading to large ground settlements.

56 The first three defendants should have been aware of the results of this soil test and of the vulnerable nature of the soil in the area of the site and below the AA Building. Before OHK started work, they and Da Zhong would also have been aware of the contents of the first Graham Miller

report. They would have known that settlement activity had taken place under the sub-station as evidenced by the cracking seen. Neither Da Zhong nor OHK make any enquiries or investigations of the foundations of AA Building prior to commencement of their works even though the extensive cracking in the back lane façade would have suggested to an expert engineer (as it did to Mr Patterson-Kane) that the foundations of the annex were possibly shallow. It was clear also from Mr Patterson-Kane's evidence that construction activities at 57 Robinson Road were bound to affect AA Building unless sufficient protective measures were put in place.

57 In was Dr Pugh's evidence that the method of construction adopted by OHK was inappropriate. He also opined that the methods and precautions taken later after the damage had been sustained should have been adopted in the first instance. OHK started work on 15 March 1995. The first cracks were noted slightly less than two weeks later and this was before the actual demolition began in April 1995. OHK, however, took no steps to reduce the impact of their work. They did not erect any temporary retaining wall between 57 Robinson Road and AA Building. They did not produce any other type of underpinning or temporary support to counteract the removal or interference with the support to AA Building. It should also be noted that the building permit issued to the first three defendants imposed an obligation on the professional engineer in charge of the project to take all necessary precautionary measures and constantly monitor the effects of piling/excavation works to ensure that the adjacent properties were not damaged or disturbed, and to prop up the affected surrounding structures to prevent damage if the damage was likely to be caused by the construction works. In my judgment, OHK was negligent in the way they conducted their demolition works in view of the conditions existing on site. It was their removal of the support which both the building on 57 Robinson Road and the land beneath that building gave to AA Building that caused the cracking and the subsidence which I have detailed above.

58 Moving on to Falcon, they too were in breach of their duty to ensure that AA Building was not affected by their works. They had a copy of the soil investigation carried out by Da Zhong. They had, or should have had, access to the first and second Graham Miller reports. They also appointed Thomas Howell to do an inspection on their behalf and from such inspection, they would have known that AA Building had already been affected by the construction works. They, however, did not take any immediate steps to ensure that AA Building would not be further damaged when they commenced their piling works. They even started their work at the rear of the site close to the sub-station, the most vulnerable part of AA Building, without considering whether any additional support for the building should be provided. Whilst Falcon was concerned about the possible effect their works would have on the nearby MRT tunnel, they did not show as much concern about AA Building. Their project manager, Mr Theodoros Constantinou, thought it was reasonable for Falcon to assume that AA Building was properly built on piled foundations. Obviously, they had not paid sufficient attention to the results of the various survey reports. As pointed out above, both Mr Patterson-Kane and Dr Pugh agree that Falcon's piling works caused the serious settlement problems that AA Building experienced in August 1995. It is clear also from the evidence that until work was stopped at the end of August no precautionary steps had been taken by Falcon to prevent such damage. In my judgment, they were negligent.

(iii) Liability of Da Zhong

59 The Court of Appeal decision in *Xpress Print Pte Ltd v Monocrafts Pte Ltd* [2000] 3 SLR 545 laid down the principle that a landowner in Singapore has a duty not to cause damage to his neighbour's land by excavating or otherwise removing his land without first securing alternative means of support. It also held that this right would be infringed as soon as, but not until, damage was sustained in consequence of the withdrawal of that support.

60 When Da Zhong decided to redevelop 57 Robinson Road they had a duty to consider whether their construction activities would remove support from AA Building and to take steps to ensure that the removal of such support would not cause damage to AA Building. This duty could not be delegated and therefore the appointment by Da Zhong of independent demolition contractors and piling contractors did not relieve them of their obligation to ensure that there were sufficient alternative means of support for AA Building before the work of demolishing the building at 57 Robinson Road and the excavation of that site commenced. Whilst Da Zhong did appoint a professional engineer for the project, this did not result in any alternative means of support for AA Building being provided prior to the commencement of construction activities on the site. As I have stated, the evidence shows that OHK's activities resulted in AA Building losing the support it had enjoyed from both the building and the land at 57 Robinson Road. Da Zhong, having failed to prevent this loss of support, is also liable for the damage that resulted.

61 What about Falcon's work? The support of the land and building at 57 Robinson Road had been removed before Falcon started work. In these circumstances, would Da Zhong be responsible under the *Xpress Print* principle for the damage that those piling works created? Dr Soh's opinion was that the withdrawal of the support of 57 Robinson Road and the piling work caused the cantilever action (ie the manner in which the adjacent beams of 57 Robinson Road supported the sub-station) 'to come to a new equilibrium'. By this he meant that these works had caused the sub-station to settle dramatically in August 1995. The amount of settlement found was about 25 mm. Dr Soh saw wide cracks when he came on site in August 1995 and was very concerned about the cracks widening further. At the time he expressed the opinion that the structure of the sub-station had already reached the stage where it might not be able to sustain any further settlement. Dr Pugh's opinion was that the vibrations resulting from the piling could have caused the soil under the foundation of the sub-station to densify and then the foundation to subside. The densification and subsidence would in his view occur almost immediately in response to the vibration although the movement would continue after the vibration had ceased. Mr Patterson-Kane also expressed the view that the piling works caused additional ground settlement beneath the sub-station though he considered the substandard foundation of the sub-station to be a major contributing factor to the damage which AA Building sustained.

62 On the evidence of the experts therefore, the consensus seems to be that in one way or another, the piling works which Falcon did interfered with the support which the sub-station had previously enjoyed. The initial effect of withdrawal of support manifested itself whilst OHK was at work. Da Zhong had a duty to ensure that the further works carried out by Falcon did not aggravate the damage arising from the withdrawal of support or further interfere with the support of that building. In my view, such a duty would be part of the duty established by *Xpress Print*. Da Zhong did not fulfil that duty and therefore must also be held liable for the damage resulting from Falcon's work. This liability would encompass all damage caused by such work including any damage occurring after Da Zhong leased the site to FCAL. Since the work took place before the lease took effect, I do not have to consider whether *Xpress Print* would impose a duty on Da Zhong as landowner for works commissioned by the lessee under a long term lease.

(iv) Repairs and rectification

63 The first three defendants submitted that whatever damage their construction activities had caused, these had been rectified and repaired. The danger to the structural stability of AA Building had been removed by the installation of supports and AA Building had been protected from the effect of further construction works on the site. There are two issues here. The first is whether the stability problem that AA Building experienced has been solved and the second is whether the other damage such as cracking and debonding of tiles has been repaired.

64 Dr Soh was appointed by Da Zhong to design a system that would stop all settlement of AA Building. His proposal was submitted on 1 November 1995. It contained two elements. The first was in respect of measures to be taken to prevent works on the site interfering with the support of AA Building. The suggested remedy was to emplace sheet-piling all along the boundary between AA Building and the site. Secondly, measures to strengthen the foundation of the sub-station were suggested. These were to construct external steel frames and then pin AA Building onto the new building at 57 Robinson Road and also to erect struts inside the sub-station.

65 Following Dr Soh's advice, a steel frame was constructed on two external walls of the sub-station, the one facing the construction site and the other facing the back lane. The frame itself was supported by two rows of sheet-piles driven to hard ground along the side of the sub-station facing the construction site. These were tied up by strong capping beams. According to Dr Soh the whole system formed a solid support supporting all the structural loading from the annex. Dr Soh's opinion, based on the evidence that he had seen, was that these works stopped the settlement and rendered the sub-station stable and able to stand for at least the next 30 years without any problem. The plaintiffs themselves noted during an inspection at the sub-station on 8 April 1996, after the remedial works were done, that there was no apparent deterioration visible inside the sub-station although some line cracks were seen externally on the front entrance.

66 The plaintiffs' evidence on the resolution of the stability problem was less positive. Among the documents adduced were two reports from a professional engineer, Mr Tan Si Jue, of the firm of Uni-Associated Consultants. In December 1999, he was asked to conduct a visual inspection of AA Building in the manner prescribed under s 28 of the Building Control Act (Cap 29); to record all structural defects observed during the inspection and to prepare and submit a report to the building authority. In the conclusion to his report issued in early 2000, Mr Tan noted that he had seen structural defects at the 4-storey section adjoining 57 Robinson Road and Boon Tat Link. At the corner of this particular section, there was a visible settlement and cracks on the floor slab and walls were observed at the first, second, third and fourth storeys. Mr Tan opined that these cracks were mostly due to uneven settlement of the foundation arising from the effects of the adjacent construction. Other cracks which he noticed on the wall facing Boon Tat Link at the second, third and fourth storey were probably due to the effects of the basement construction at the Kajima site. He recommended continuation of close monitoring of cracks and tilting of façade and columns for another six months and then the carrying out of rectification works to prevent further uneven settlement. On 22 March 2000, in answer to some queries on his report, Mr Tan advised the plaintiffs that the overall structure of the building was still stable and sound.

67 In April 2001, Mr Tan carried out another inspection of AA Building. He noted the defects found and concluded that there was one localised area at the rear corner of the building which was under structural distress. Mr Tan considered that the overall structural integrity of the building was not in jeopardy but advised that it was prudent to carry out strengthening work to support the rear corner of the building that had already been weakened by the defective corner column. Mr Tan's views can only be gauged from his reports as the plaintiffs did not call on him to testify.

68 Dr Pugh considered that AA Building had structural defects and that the remedy for this would be demolition and rebuilding of the annex. He based this recommendation on the following considerations:

(1) the settlements inferred by the level surveys, the observed damage and the result of the structural analyses suggested to him that the structure had deflected in excess of 'normal design values'.

(2) the loading factor at foundation level is now considerably altered from that as designed and the present factors of safety on the piles are unknown. It was possible that some piles are at, or in excess of, ultimate capacity.

(3) there is clear evidence that structural failure has occurred in the vicinity of the cantilever beams at second storey (first floor) level.

(4) significant overloading of some frame members is likely to have occurred.

Under cross-examination, however, he confirmed that AA Building was not in danger of imminent collapse and agreed that it was safe for the foreseeable future. He also agreed that the measures proposed by Dr Soh were generally effective to provide support and prevent earth movement. Dr Pugh also agreed that if he had been asked to advise on safety measures at the relevant time, he would probably have recommended something along the same lines as proposed by Dr Soh.

69 It should also be noted that, under cross-examination, Dr Soh conceded that he had never commented on the structural stability of AA Building from 1995 up to the date he appeared in court. He stated that the side support could never be removed as it has been built into Robinson Centre. The rear support could be removed but there was a possibility of hairline cracks appearing. As far as the internal scaffolds were concerned, he was not sure whether they should or should not be removed. At another point in his cross-examination Dr Soh agreed that it would be unsafe to remove the external steel support that had been affixed to AA Building unless a structural engineer certified that it would be safe to do so. From the beginning, his view had been that once he had taken steps to stop the settlement at the sub-station, an engineer hired by the plaintiffs should make a thorough investigation of the structural stability of AA Building. It is also relevant that in April 1997, DE Consultants asked Falcon to remove the internal struts installed in the sub-station. Mr Constantinou wrote Dr Soh for his opinion and the reply was that the struts should remain for the moment. Dr Soh had not thereafter advised Falcon that the struts could be removed. Up to the day of the trial, Falcon had not received any report from a professional engineer stating that all the external and internal supports could be removed without the structure or integrity of the building being affected.

70 The weight of the evidence indicates that the structure of AA Building is no longer as sound as it was before work at the site began. Some long term measures have to be implemented to improve its stability although the building is not likely to collapse. The works undertaken by Falcon have not provided a complete solution since, for the building to remain stable, all supports have to remain in place. This is not a problem insofar as the frame built into the side of the building facing 57 Robinson Road is concerned since it is completely covered by the new Robinson Centre. The supports on the façade facing Boon Tat Link are, however, apparent to all and are unsightly. Whilst the struts inside the sub-station are not visible externally, they, along with the external scaffolding, were intended as temporary supports and should not be converted into permanent supports if other less obtrusive methods of structural strengthening are available. On the first sub-issue therefore, I conclude that whilst the immediate settlement problem was rectified and adequate steps were taken to prevent the continuation of construction works from causing the sub-station and the annex to collapse, these steps have not completely restored AA Building to the state of structural integrity that it enjoyed in February 1995. If the building were to be reinstated, work would have to be undertaken to provide sufficient support so that the scaffolding facing Boon Tat Link and the struts in the sub-station can be removed.

71 The second issue is whether the first three defendants have repaired all the other damage which their works inflicted on AA Building.

72 Mr Constantinou's evidence was relied on by Falcon to show that it had repaired all the damage it had caused to AA Building. He stated that in September 1995, he was shown damage sustained by unit 02-01 and in November 1995, he was shown damage sustained by unit 04-07. The cracks in unit 04-07 were repaired in January 1996. Then piling works recommenced and further complaints of cracking were received from the plaintiffs. Even though Falcon had left the site in July 1996, Mr Constantinou arranged for an inspection of the building on 4 September 1996. At that inspection he was shown water stains behind units 03-11 to 03-15 and 04-03. He was also shown cracks in unit 03-03 which were allegedly new. All this damage had not been previously made known to Falcon and Mr Constantinou doubted that the water seepage and cracks were due to his piling work. However, to put a stop to the plaintiffs' complaints, a further inspection was carried out in December 1996 and all areas to be repaired were identified and marked out. Thereafter, Falcon proceeded to repair the building. In January 1997, Falcon sent DE Consultants a letter setting out the list of defects that they had rectified. On the basis of Falcon's evidence on repairs done, the first to third defendants submitted that any damage noted subsequently had been caused by the other contractors who took over the site from 1999 onwards and were not their responsibility.

73 The plaintiffs do not accept that all damage caused by the first three defendants has been repaired. They point out that the only witness from OHK, Mr Ong Hoo Kim, conceded that OHK's work caused cracks for which OHK accept responsibility and that OHK did not repair those cracks. Apart from the cracks, it was also clear from the evidence that the floor in unit 04-03 which had sunk had not been rectified and the sunken floor was still visible to the eye. Dr Pugh had seen it when he first inspected the building in June 2001. Da Zhong had known about the subsidence of the floor shortly after it happened and, as Mr Goh admitted, they knew that such subsidence was a very serious thing. No steps, however, had been taken to rectify this sunken floor. As late as May 2001, Da Zhong had written proposing to repair the damage caused by the work of the first three defendants. Finally, whilst Falcon may have repaired some of the crack damage that had manifested itself by end of 1996, the plaintiffs submitted that damage continued to show up in the subsequent survey reports commissioned by the defendants. These reports had been analysed by Dr Pugh who prepared a series of charts showing the various cracks seen by the surveyors over the years.

74 Dr Pugh noted that in a survey by Insight dated 22 July 1996 carried out on behalf of CKK, the damage which had occurred during demolition as noted by the plaintiffs and the first Thomas Howell survey was still apparent. This survey also picked up the damage caused by the early part of the piling as noted by the plaintiffs and the second Thomas Howell survey. Insight also surveyed the sub-station for CKK on 30 July 1996. The damage to the sub-station was as previously noted but the cracks had been repaired. The next survey was undertaken between 30 June and 4 July 1997 by Crawford THG (Singapore) Pte Ltd ('Crawford) for FCAL. This was a comprehensive survey of the interior and exterior of the building. Dr Pugh analysed this report and noted the following:

(1) at the first storey, there was widespread damage within the 4-storey annex none of which had been recorded in the first Graham Miller report. The damage was concentrated in the area adjacent to the sub-station, with decreasing but still significant levels of damage moving south westwards along the length of the 4-storey addition. In the sub-station, a gap was noted between the edge beam of the old roof slab of the sub-station and the edge beam of the first floor.

(2) at the second storey, there was widespread damage in the annex in the vicinity of the sub-station, extending back along the rear to the plaintiffs' directors' restroom at the junction with the 7-storey building. The survey also reported that the floor in the plaintiffs' office pantry area appeared to be sagging and the windows on the rear façade, in the managing director's room, were lopsided with 10mm displacement gaps to the frames.

(3) the pattern of damage observed in the first and second storeys was found at the third storey and displacement of windows was also recorded on the rear façade at the eastern corner (the rear corner closest to 57 Robinson Road).

(4) at the fourth floor, a similar pattern of damage to that noted on the lower floors was found.

(5) the fifth, sixth and seventh storeys had crack damage in the vicinity of the toilets, lifts and lobby areas and in the vicinity of the expansion joints.

The Crawford report which showed the situation of AA Building before any work was started by Trevi made it clear that whatever repairs had been effected by Falcon, they had been insufficient. It is also important that this survey was conducted before excavation at the Kajima site started and therefore there can be no question of the damage which Crawford noted having been caused by that excavation. Further, Dr Pugh's opinion was that even after the structural strengthening works undertaken by Falcon had been completed, AA Building continued to settle and this would have given rise to continued cracking and widening of existing cracks.

75 I am satisfied on all the evidence that the first to third defendants have not proved that they have repaired all the damage to AA Building that their work at 57 Robinson Road caused. I point out in addition that Mr Patterson-Kane also considered that there was damage caused to AA Building by Falcon's works that had not been repaired and that it would cost between $25,000 and $30,000 for these repairs to be done. No issue was taken by the first to third defendants with the truth of the various survey reports I have mentioned. In fact copies of these reports were furnished by them to Mr Patterson-Kane for him to consider when preparing his expert report.

The plaintiffs' claim against Trevi, the fourth defendants

(i) Preliminary issue

76 Before I consider the evidence, there is a preliminary issue to be decided in relation to the plaintiffs' claim against Trevi. It arises in this way.

77 By the time the trial started, Trevi had filed affidavits of seven witnesses who they proposed to call to give evidence on their behalf. They had also filed 44 bundles of documents. The plaintiffs closed their case on 10 April 2002. The case was then adjourned at the request of the plaintiffs. The adjourned hearing resumed on 2 September 2002 with the first to third defendants opening their joint defence. On 25 September 2002, Trevi filed an application to strike out the plaintiffs' claim against them. I dismissed this application.

78 The first to third defendants concluded their case on 14 January 2003. At that stage, counsel for Trevi informed me that his clients would be making a submission of no case to answer and consequently they were electing not to call any evidence. The plaintiffs objected to this step. After hearing arguments, I ruled that I would not entertain a submission of no case to answer from Trevi because it had been made too late. Counsel for Trevi then indicated that, in any case, Trevi elected to call no evidence pursuant to O 35 r 4(3) of the Rules of Court. The plaintiffs then applied for an order that Trevi be refused leave to withdraw the affidavits of evidence-in-chief of their witnesses and a further order that the plaintiffs be allowed to cross-examine all Trevi's witnesses. I refused to grant those orders. First, I took the view that the affidavits of evidence-in-chief had not been admitted into evidence since the witnesses had not been produced to affirm them. Secondly, I thought it would be nonsensical to give a party the right of election not to call any evidence and at the same time say that the evidence was already in court. The fifth defendants also elected to call

no evidence. Thereafter, the case concluded with my giving directions for the filing of written submissions by the parties.

79 In their written submissions, the plaintiffs sought to reopen the arguments they had made on 14 January 2003 in relation to Trevi's election not to call any evidence. They submitted that Trevi was not entitled to invoke O 35 r 4(3) because that rule has no application where the evidence-in-chief has already been given by way of affidavit which has been filed in court for the trial. They also said that no basis can be elicited from O 38 r2 which deals with the rejection of the affidavit evidence when a witness defaults in attendance at court and that neither sub-rule confers any right on a litigant to withdraw the affidavits which he has filed on the ground that he has elected not to call his witnesses. The plaintiffs further submitted that the motive for the withdrawal was important and the court was vested with power to deny any withdrawal which sought to abuse court process by O 92 r 4. The plaintiffs contended therefore that they were entitled to refer to affidavits filed on behalf of Trevi for the purpose of establishing their case.

80 Trevi's reply was that these submissions should be rejected out of hand. The plaintiffs were trying to mount a backdoor appeal against the court order of 14 January. The plaintiffs had not appealed against that order within the time required and were using the closing submissions to mount a baseless attack on the court's previous orders without going through the proper process of an appeal. Trevi cited *Poh Soon Kiat v Hotel Ramada of Nevada* [1999] 4 SLR 391 where Tay Yong Kwang JC held that there would be absolute chaos in the judicial system if a judge was allowed to reopen a matter long after it had been decided by himself or by any other judge exercising a co-ordinate jurisdiction.

81 I am in full agreement with the position taken by Trevi on this issue. When Trevi elected not to give evidence, I was of the view that the affidavits of evidence-in-chief previously filed by Trevi were not evidence in the case as no witnesses were produced to confirm them. I refused the plaintiffs' application that I should order the affidavits to stand and order Trevi to produce their witnesses for cross-examination. The plaintiffs should have appealed against my order if they were dissatisfied with it. Having failed to lodge an appeal within the appropriate period, they are not entitled to resurrect the argument in the closing submissions. The effect of my order was that none of the affidavits or documents intended to be adduced by Trevi formed part of the evidence in the case except for those documents which Trevi had agreed should form part of the agreed bundle. Whilst Trevi has also made legal submissions in support of my rulings on 14 January, I will not go into substantive matters here. Whether my rulings were correct as a matter of law or not is not in issue. The only preliminary issue that I have to decide is whether the plaintiffs can renew their arguments to be allowed to refer to the contents of the affidavits filed by Trevi. In my judgment, they cannot. This was a matter they were not entitled to bring up again except in relation to the question of costs which I told them at the time could be included in the submissions since I had made no ruling on costs. In my consideration of the evidence in relation to the plaintiffs' case against Trevi, I will not be looking at the affidavits filed on Trevi's behalf or any document in those affidavits or in their 44 bundles that is not also in the agreed bundle.

(ii) The evidence relied on by the plaintiffs

82 The plaintiffs rely on the evidence of Mr CC Goh. Originally appointed as project manager by Da Zhong, Mr Goh remained in that position when FCAL took over the site and constructed Robinson Centre on the combined plots. During cross-examination, Mr Goh was asked by counsel for the plaintiffs whether he had checked with OHK and Falcon as to whether those parties were prepared to accept responsibility for any of the defects. Mr Goh's response was that they accepted responsibility except for the few defects that they claimed were pre-existing. He was then asked what Trevi's

position was and he replied 'Same answer'. Subsequently, counsel for Trevi asked Mr Goh whether he had anything in writing as regards Trevi's alleged acceptance of responsibility. Mr Goh said 'I think so'. It was pointed out that this letter was not in his affidavit. He agreed. He was then asked whether it was he or someone else who had checked with Trevi and he replied that it had been DE Consultants. Counsel then stated that his instructions were that Trevi did not at any time accept any responsibility for any of the damage to AA Building and therefore counsel put it to Mr Goh that his answer that Trevi was prepared to admit liability except for a few pre-existing defects was not true. Mr Goh disagreed.

83 The plaintiffs submitted that as Trevi had elected not to call any evidence, there was no foundation for their last question to him. The purported basis of the question, ie that counsel was instructed by Trevi that they had not accepted responsibility, had to be disregarded. The only foundation for such a put question would be evidence adduced by Trevi but since they elected not to call a single witness, that foundation did not exist. The plaintiffs submitted that I should draw an inference that if a witness had been produced on this point, his evidence would have been adverse to Trevi. They also submitted that I should draw an adverse inference from the fact that Mr Tan Chiew Song of DE Consultants was withdrawn as a witness. If Mr Goh's evidence that it was DE Consultants who determined this acceptance of responsibility from Trevi was untrue, Mr Tan would have been called. Even if he was not called because of Trevi's fear of other evidence being adduced on cross-examination of Mr Tan, another representative from DE Consultants could have been called to deal with the point. None was. On the foregoing basis, the plaintiffs submitted that Mr Goh's evidence that the acceptance of responsibility appeared in writing was completely unchallenged.

84 Whilst considering that the purported acceptance of liability was sufficient for liability to be established against Trevi, the plaintiffs went on to submit that there was other evidence showing damage had occurred during Trevi's works. This evidence was:

(1) a memorandum written by Ms Nancy Chiang, the plaintiffs' administrative manager, recording that on 27 February 1998 she reported to one PC Tan of Trevi that the glass tell-tale installed on the wall of the pantry of the plaintiffs' office (tell-tale 42) had cracked.

(2) the plaintiffs' letter of 4 March 1998 to Trevi documenting the fact that Trevi's representatives had visited AA Building on 28 February and taken photographs of the pantry wall.

(3) text authority showing that the cracking of a glass tell-tale is associated with continuing subsidence or settlement.

(4) whilst on 5 March 1998, Trevi had asked the plaintiffs for permission to enter AA Building every Thursday morning to monitor the glass tell-tales, they had withheld the results of their monitoring from the court and not led any evidence on the same.

(5) on 10 March 1998, the plaintiffs inspected the sub-station as they had received a report that the ground area where the concrete plinth previously sat had sunken. They found a clear hollow space under the floor surface where the plinth used to sit.

(6) a letter from their consultants relating to crack damage in a brickwall in the sub-station found on 10 March 1998 and another document relating to cracks and damage to the sub-station observed on 16 April 1998.

(7) a memorandum dated 24 March 1998 in which Ms Chiang recorded that vibrations were experienced at 11.45 am that day.

(8) an unsigned memorandum dated 18 May 1998 recording a complaint received from the office of Manjit Samuel & Partners at unit 04-07 that wall cracks appeared to have widened and a subsequent inspection of the premises by FCAL's personnel.

85 The plaintiffs also called in aid Dr Pugh's evidence that there was ground movement and Mr Crispin Casimir's evidence that the cracking of the glass tell-tale indicated ongoing ground movement. Further, in Dr Pugh's supplemental report, he had stated that during Trevi's work there was some widening of cracks in the rear façade and a comparison of two survey reports made by Dr Pugh showed that a particular single crack at the McCallum Street end of AA Building had widened during Trevi's work. The plaintiffs submitted that as there was no evidence from Trevi challenging this, liability was established. They also relied on Dr Pugh's evidence that it was probable that vibrations from Trevi's work contributed to the widening of that crack and the widening of the cracks in the rear façade. Finally, the plaintiffs cited some information that they obtained from affidavits of Trevi's witnesses. I will not deal with those parts of the plaintiffs' submissions since, as I have already said, none of that information is in evidence in this case.

86 There are difficulties with the quality of the evidence that the plaintiffs relied on. First, as regards Mr Goh's testimony, as Trevi submitted, the evidence that Mr Goh gave regarding Trevi's alleged acceptance of liability was hearsay. Mr Goh did not speak to anyone from Trevi himself and was only reporting what he had been told Trevi had allegedly told someone (unidentified) from DE Consultants. Such evidence is not admissible. Although Mr Goh thought he had a letter from Trevi which confirmed such acceptance, that letter was not produced in evidence by Mr Goh and the plaintiffs did not even ask for discovery of it. One cannot place any weight on an alleged letter which is not produced since there is no way of establishing the writer, the addressee, the context in which the letter is written or the actual extent of the admission made. All these matters would go to the weight to be accorded to the written acceptance. Further, as Trevi submitted, if the 'writing' admitting responsibility existed, Da Zhong would surely have pleaded negligence or contributory negligence on the part of Trevi. Da Zhong did not do so.

87 As regards tell-tale 42, first, Trevi disputed that the text authority cited by the plaintiffs was sufficient to show that the cracking of a tell-tale glass is associated with continuing subsidence or settlement. They point out that the text also states that cracks should not be assumed to arise from a single causal defect or even from a simple combination of defects occurring in sympathy. Secondly, they submitted that the plaintiffs did not even have proven observations of new cracks or widening of pre-existing cracks where tell-tale 42 was placed. All that the plaintiffs experienced was the solitary cracked tell-tale itself. There was no evidence of the widening of a pre-existing crack in the wall to which tell-tale 42 was affixed. Trevi noted that the text the plaintiffs cited also stated that the applicability of the tell-tale technique was limited and that the system was vulnerable to general or malicious damage and gave no indication of the degree of movement or its exact form. In this case, tell-tale 42 was located outside the plaintiffs' office pantry area where there would be high human traffic flow which would increase the probability of human intervention or general damage. Thirdly, Mr Casimir's evidence was that after tell-tale 42 cracked, a new tell-tale, no. 42A, was placed beneath tell-tale 42 and over the same pre-existing crack. That would have been around March 1998. Tell-tale 42A was still intact when Mr Casimir surveyed it in mid 2001 thus indicating minimal if any ground movement had taken place. Finally, there was no evidence at all that any of the pre-existing wall cracks over which tell-tales had been put up had been observed by anyone to have widened during or after Trevi's works. The observations of STIMC Protection Associates who conducted a post condition survey of AA Building and others for Trevi in July 1998 (their report was exhibited in Nancy Chiang's affidavit) were that their survey revealed that generally there had been no exacerbation or deterioration to existing damage caused by Trevi's works. The 'crack meters' installed at various locations at AA Building had been monitored frequently and did not show signs of deterioration during

the previous few months.

88 On the balance of probabilities, it was not proven by the plaintiffs that tell-tale 42 cracked because of ground movement. The cracking of no. 42 may just as well have been due to other factors given that tell-tale 42A remained in place for more than three years without cracking. In any event, even if ground movement had caused the tell-tale to crack, that ground movement did not cause further cracks in the area of the tell-tale. Additionally, it has not been proven that the ground movement was caused by the work of Trevi. All the experts agreed that there was continuing settlement (or ground movement) in the area occupied by AA Building and that process would go on for years. Dr Pugh had testified that there was continuing settlement from 1995 to 2001 and even as at the date he testified because of:

(1) consolidation settlement and creep movement beneath the sub-station as a result of the changed foundation loading pattern resulting from the tilt of the sub-station following its subsidence;

(2) consolidation settlements and creep movements of piled foundations resulting from increased loads;

(3) ongoing very small settlements as a result of the loading applied between 1970 and 1974 (ie when the annex was constructed).

On that basis, most of the ground movement resulted from the work of the first three defendants and the balance from the construction of the annex itself.

89 Moving to the plaintiffs' reliance on the cracks observed in the sub-station in March and April 1998, Trevi submitted that these cracks never formed part of the plaintiffs' case against Trevi. First, the two alleged cracks observed in March and April are actually the same crack ie a wide crack in the brick trench wall. The correspondence from the plaintiffs' consultant Meinhardt (dated 16 March and 24 April 1998) shows this. Secondly, Meinhardt themselves say that 'it is not possible to conclusively ascertain when the crack occurred'. That is why it was never part of the plaintiffs' or Dr Pugh's case that these cracks were caused by Trevi.

90 As regards the plaintiffs' reliance on the hollow space observed in the sub-station, Trevi submitted that this subsidence had never previously been part of the plaintiffs' case against Trevi for the same reasons as just cited in relation to the cracks. They submitted that the subsidence had probably taken place some time prior to March 1998 but had not been observed earlier because it was hidden. The subsidence came to light only after the concrete plinth supporting the second transformer was hacked off which work had also resulted in the discovery of the crack in the brick trench wall.

91 It is not clear to me from the correspondence that the crack observed by Meinhardt in the sub-station on 16 April was the same crack previously observed in March. It is, however, clear that however many cracks were discovered during this period they, and the hollowness, were found because of the removal of the transformer. There is no telling therefore when they occurred. The main damage to the sub-station was caused by Falcon and OHK and it is probable that these cracks and hollowness resulted from the same cause. The plaintiffs did not call any evidence which established on balance that this damage resulted from Trevi's work. It is notable that Dr Pugh did not make any assertion of this nature.

92 Regarding the memorandum of 18 May 1998 which states that wall cracks at unit 04-07 'appear to have widened', Trevi pointed out that the note also said that after inspection of the unit,

the engineer noted that the tell-tales were still okay and there was therefore no cause for alarm. In any event, they submitted that no reliance could be placed on the note as it was not even known who the author of the note was and none of the plaintiffs' witnesses had given evidence on it. It was interesting that none of the plaintiffs' witnesses referred to the note and the inspection especially since one of the witnesses was Mr Samuel Chacko who was a partner of Manjit Samuel & Partners at that time. He would surely have been able to give some evidence on what had happened to the cracks in his office at that time but his evidence was limited to cracks observed in August 1995. In my view, the evidence to be gained from the memorandum is not of much weight. At the most, it would show some minor widening of cracks occurred during Trevi's work.

93 The most weighty of the evidential matters raised by the plaintiffs in support of their case that Trevi's works damaged the building, related to the widening of a crack at the rear façade and its link to vibration and noise from Trevi's activities. Trevi submitted that the plaintiffs had not proved either that this crack had been widened by their works or, even if it had, that their work had been carried out negligently. They submitted that the plaintiffs' own evidence showed that there were numerous causes that probably caused the damage that AA Building sustained.

94 The evidence before me has established that:

(1) Trevi came on to the site after AA Building had already sustained considerable subsidence and damage.

(2) Trevi came on to the site after the steel frame, sheet piles and scaffoldings had been installed (the strengthening works).

(3) the purpose of the strengthening works was to provide support to AA Building and to prevent further earth movement and these works were proposed by a professional engineer (Dr Soh) and endorsed by another professional engineer (Mr Tan of DE Consultants) and approved by a third (Mr Gary Wyatt).

(4) Dr Pugh agreed that the strengthening works were generally effective to provide support and prevent earth movement.

Dr Pugh's evidence was that he also approved the method of installation adopted by Trevi. He also agreed that Trevi's methods met the standard required of normally competent engineers. Dr Pugh agreed with Mr Patterson-Kane that all significant damage to AA Building had already been done by September 1995. Thereafter, there was some additional slight damage and the one particular crack that developed over that period. He agreed that after Trevi finished their work at the site there was slight widening of only one pre-existing crack. This crack was located at the second or third storey of the rear façade of the building near the McCallum Street end. He also agreed that the widening of the crack could be due to the continuing settlement which had started in 1995 and was ongoing up to the date of the trial. Dr Pugh also said, however, that he believed that the crack widened as a result of movement at the sub-station end and that there was evidence that movement was observed by the plaintiffs when piling activities were taking place adjacent to the sub-station. In response to questioning he then confirmed that in his reports he had not mentioned the widening of cracks at the sub-station end of the rear façade because he had found no evidence of such widening. When I commented that it was odd that the cracks near the sub-station end did not widen but the crack further did, the witness's response was that the cracks at the sub-station end had been resin-grouted by this time and it seemed feasible that the structure subject to further movement would move at what was currently the weakest point. He was next referred to the chart of the cracks which he had made. Thereafter Dr Pugh agreed that not all the cracks at the sub-station end had

been resin-grouted when Trevi was at the work site. Finally, Dr Pugh agreed that both piling activities and continuing settlement could have contributed to the movement of the building and he thought that the vibration contributed to the widening of the crack as the plaintiffs had referred to widening of the cracks in the rear façade in the same period.

95 Dr Pugh was not on site at the material time. He was reconstructing what had occurred from various reports given to him and the inspections that he carried out some time after all works had ended. Dr Pugh was asked whether the excavation works at the Kajima site could have caused the cracking in the rear façade of AA Building. His opinion was that they probably did not because he could not see any sign of damage on the back lane separating that site and AA Building. It should be noted, however, that the evidence was that at the time Dr Pugh saw the back lane, it had been recently re-tarred and therefore its intact state was not proof that the excavation at the Kajima site had not caused any subsidence that affected both the back lane and the façade of AA Building.

96 Mr Tan Si Jue's opinion as disclosed in his first report was that the cracks on the façade wall facing Boon Tat Link at the second, third and fourth storeys were probably due to the effect of the excavation for the construction of a basement at the Kajima site. The plaintiffs had commissioned this report and put it in evidence but they did not call Mr Tan to explain this opinion or to ask him to explain why he held an opinion that was contrary to that of Dr Pugh. Further, Dr Soh testified that during the period 1998 to 2000, this excavation would have been the major cause of any cracks and widening of cracks at AA Building. He had personal knowledge of the excavation. The plaintiffs themselves and their tenants had, during the relevant period, complained about the noise and vibrations emanating from the Kajima site. The plaintiffs' witnesses testified that the demolition of the old Shing Kwan House and the subsequent construction of the new building were major construction works. Also, the plaintiffs had made many complaints about the works both to the contractors at the site and to the authorities. One of the directors of the plaintiffs, Mr Tan Chin Hoon, testified that the demolition work at the Kajima site was a 'big job, tough job' and that it caused a lot of noise. He said that the piling activities at the Kajima site were also very noisy and caused a lot of vibrations.

97 I accept Trevi's submission that given all of the evidence and matters listed above, the plaintiffs have not proved negligence on the part of Trevi. Whilst accusing Trevi of causing the widening of one pre-existing crack at the rear façade, some of the plaintiffs' own evidence suggests that this crack could have been caused by continuing settlement and/or the construction works at the Kajima site. Further, effective measures to prevent damage to AA Building had been put in place before Trevi worked on the site. Over and above this, the plaintiffs' expert approved Trevi's work method and agreed that Trevi had met the standard of a reasonably competent engineer. Even accepting Dr Pugh's opinion as proof that the widening of the one crack was due to Trevi's work, it is clear from the plaintiffs' own evidence that that claim is de minimis and frivolous. Mr Tan Si Jue had quantified the cost of rectifying the cracks at the second storey of the rear façade as being $3,600. This figure would cover 12 metres of pressure grouting and the cost of erecting scaffolding. Even if the cost of rectifying one crack was not substantially less, in the context of the entire claim which the plaintiffs mounted against Trevi, that would be a really small amount.

98 The plaintiffs submitted that negligence on the part of Trevi could be established by the application of the doctrine of *res ipsa loquitur*. They submitted that Trevi would have been alerted to the need for precautionary measures to be taken on the site before they started work given the change in the project from the construction of a 13-storey building to the construction of a 20-storey building and the continuing evidence of subsidence and damage charted in the various survey reports. There was no evidence that any such precautionary measures had been taken before Trevi started their piling works. Therefore, since damage was caused during Trevi's works, Trevi was

negligent.

99 For the doctrine of *res ipsa loquitur* to apply in order to prove negligence, however, it must be established that:

(1) an event has occurred which in the ordinary course of things is more likely than not to have been caused by negligence; and

(2) the defendant must have managed the event.

In this case, it is hard to see that these ingredients have been satisfied. First, there was a building that had been damaged between 1995 and 1996. Secondly, that building had been strengthened thereafter. Thirdly, there was another on going building construction which could have contributed to the damage attributed to Trevi. Fourthly, Dr Pugh agreed that there was continuing ongoing settlement by reason of the earlier activities that could cause the widening of existing cracks. There was also the evidence of Dr Soh on the causes of those cracks. Next, Mr Casimir testified that the fact that one can feel vibrations does not mean that those vibrations are going to cause damage to the building one is in. Mr Tan Yok Koon, another director of the plaintiffs, also testified that a particular item of damage that may have occurred when Trevi was on site may have been caused by Trevi and may also have been caused in something resulting from what had been caused earlier by OHK and Falcon. All these circumstances make it impossible to draw the conclusion that, more probably than not, the damage noted while Trevi was on site was necessarily the result of negligence on the part of Trevi.

100 The plaintiffs also relied on the principle enunciated in *Xpress Print* to impose a strict duty of care on Trevi. In my judgment, however, that principle does not apply to Trevi. As stated above, the principle binds one landowner not to damage his neighbour's property by interfering with the support afforded to that property by his own land. Trevi was a contractor not a landowner. At various points in the judgment of the Court of Appeal, it was made clear that the court was only considering the duty which one landowner owed to his neighbouring landowner. Such neighbouring landowners were the parties involved in *Xpress Print*. There was no contractor involved in that case and the Court did not purport to lay down any principle imposing a strict liability on a contractor. Trevi's duty was to exercise reasonable care in their works to prevent any damage being caused by such works to AA Building. Trevi would not be responsible if, despite their having exercised such reasonable care, damage nevertheless occurred.

101 In all the circumstances therefore, the plaintiffs have failed to establish that Trevi was responsible for damaging AA Building.

The plaintiffs' claim against the fifth defendants, CKK

102 CKK was on the site on two occasions. The plaintiffs made separate submissions on the damage allegedly caused by CKK on each occasion. CKK did not adduce any evidence themselves as to the work that they did as, at the end of the case presented by the first to third defendants, they elected not to call any evidence.

Claim for damage caused between 12 July 1996 and 1 January 1997

103 On the first occasion, the work carried out by CKK was mainly in relation to the excavation for and the construction of pile caps. The plaintiffs summarised the evidence of the damage that they alleged occurred as a result of these works as follows:

(1) a letter from the plaintiffs to Da Zhong dated 22 August 1996. It documented defects in the plaintiffs' office in the form of more cracks appearing in the pantry area (including the toilets) and in the tiled area in the toilet located at the other end from the pantry area, and leakage of water from the ceiling. Water seepage in units 03-03, 03-11 and 03-15 was noted. It was also stated that new cracks had appeared on the walls of unit 03-03 and 04-03 thereby showing further movement to the building.

(2) a letter dated 16 October 1996 from the plaintiffs' solicitors to Da Zhong's solicitors. It complained that water was still leaking into the plaintiffs' office premises when it rained. Additionally, areas of previous remedial works carried out by Da Zhong's contractors were showing signs of problems again in that crack lines had reappeared and there was blistering. Also, cracks on the walls of the common corridors at various levels in the building had widened.

(3) a letter dated 31 October 1996 from the plaintiffs' solicitors to Da Zhong's solicitors. It complained that up to that date, remedial works had yet to commence and, as indicated in the previous letter, the leakage and widening of cracks in question had been affecting the plaintiffs' marketing of available vacant units in AA Building.

(4) a letter dated 18 November 1996 from the plaintiffs to Da Zhong. It reported that on 12 November 1996, the tenant at unit 05-08 had reported visible cracks inside their office premises and that DE Consultants had been advised of this and inspected the cracks that same evening. Further, crack lines had been found on the marble wall façade of the ground floor unit.

(5) Dr Pugh had charted the defects and damage floor by floor as recorded in the three Insight reports which were commissioned by CKK before commencement of their works. He also charted the damage floor by floor as recorded in the Crawford report which was done after CKK left the site. A comparison of the charts shows a substantial increase in the number of defects occasioned to AA Building after CKK's work on site.

104 The plaintiffs further submitted that despite the aforesaid evidence which they considered sufficient to establish liability if left unchallenged, CKK did not lead any evidence. In particular, they did not put in any evidence to show that any precautionary measures were taken by them during their excavation works. The plaintiffs pointed out that the PWD general specification indicates that for excavations the contractor shall provide all necessary planking, strutting and shoring required to uphold the face of the excavation. Such planking and strutting has to be of sufficient strength to resist all anticipated loadings, to ensure the safety of the workmen, and to prevent damage to any adjoining property.

105 In response, CKK submitted that the plaintiffs had not proved that CKK was on the site between 12 July 1996 and 1 January 1997. In this respect, the plaintiffs had relied on Mr Patterson-Kane's report which provided the dates when CKK was on the site but, as CKK submitted, insofar as such information is concerned, it was hearsay. Mr Patterson-Kane had no personal knowledge of the site conditions and his first inspection of the site took place only in October 2001. The other document on which the plaintiffs relied to show that CKK had done piling works in July and August 1996, a letter from Crawford, was also hearsay since the maker of the letter had not been called and, in any case, was himself relying on reports made to him rather than personal knowledge. I agree with the submission that the Crawford letter is inadmissible and the statement in the Patterson-Kane report was hearsay.

106 On the other hand, however, Mr Goh asserted in his affidavit of evidence-in-chief that the worksite was handed over to CKK on 12 July 1996 and CKK thereupon started main contract works on

the 13-storey building. This assertion was not challenged by CKK in cross-examination. Mr Goh went on to say that the first task CKK had to undertake was to prepare the foundation and in order to do this, they had to erect the pile caps and this involved some excavation. Further, due to the fact that there had been previous problems with AA Building, CKK also installed sheet piles and injected a grout mix into the soil to strengthen it. These were measures taken to eliminate soil movement and vibration. After this was done, CKK started excavation works for the purpose of cutting the piles in the section next to AA Building. CKK started this work from the front of the work site and carried on until they had reached about half way towards the rear. That was when all work stopped. Under cross-examination by counsel for CKK, Mr Goh explained that the excavation undertaken by CKK was to expose the top part of the pile for construction of the pile cap and that this process involved the moving of earth and soil away from the pile caps concerned. Whilst Mr Goh was not on the site all the time, he was able to confirm that on the several occasions when he was there during the period from 12 July 1996 to the beginning of January 1997, he saw that CKK excavated the soil using the 'changkul', ie manually. I am satisfied that there is sufficient evidence to establish that CKK was on the site during the relevant period between July 1996 and January 1997.

107 CKK's second submission was that the plaintiffs had not proved that the defects which manifested themselves during the relevant period were caused by CKK and that, in any event, these defects had been rectified. In support of this submission, they pointed out first that all the documents on which the plaintiffs relied to found their claim were directed to Da Zhong. Secondly, in respect of the letter dated 22 August 1996, Mr Goh was asked whether he wished to challenge its contents and his reply was that he did not. Then, in respect of the letter dated 16 October 1998, Mr Goh was asked who had done those works and his reply was that both OHK and Falcon had done them. Finally, Mr Goh had confirmed that as of 23 January 1997, all defects which had been raised to Da Zhong by the plaintiffs had been rectified. The contention was that it was therefore apparent that with respect to the defects documented in the letters cited by the plaintiffs, the evidence elicited by the plaintiffs in cross-examination showed that OHK and Falcon were responsible for these defects and the same had been rectified. That being the case, they could not be the subject matter of a claim against CKK.

108 As regards the charts compiled by Dr Pugh, the response of CKK was that Dr Pugh had relied on survey reports prepared by others and the persons who prepared the reports had not been called as witnesses. The reports were therefore hearsay evidence and insofar as Dr Pugh relied on them, his data was also hearsay. I can only partially accept this submission. CKK themselves had commissioned three of the reports relied on by Dr Pugh namely three reports from Insight, the first dated 21 March 1996, the second dated 24 July 1996 and the final one dated 14 August 1996 but referring to a survey carried out on 30 July 1996. These reports had been agreed to by all the parties as being admissible without the makers being called. Whilst including the documents as part of the agreed bundle did not mean that CKK agreed to the truth of all the contents of those documents, since CKK had commissioned them, it is my view that if they wished to discredit the observations therein they would have had to produce other evidence. CKK did not adduce any such evidence. I therefore draw the inference that CKK had no quarrel with the contents of these three reports. However, this holding cannot extend to the reports of other surveyors who were not commissioned by CKK. The surveyors who surveyed AA Building after CKK finished their work during this first period were not called by the plaintiffs to testify. The truth of their survey reports has not been established as against CKK. Thus, the plaintiffs cannot rely on those survey reports and those portions of Dr Pugh's analysis which are based on the same as evidence that CKK's work caused damage to AA Building.

109 The next submission of CKK was that even assuming that additional defects had been identified as having occurred during the time that CKK was on the site, this does not automatically

lead to the inference that CKK was the cause of those defects. CKK's works in fact could not have been the cause of any additional defects because:

(1) the nature of CKK's works would not cause the defects;

(2) Dr Pugh's own evidence was that the defects would have been caused by soil settlement and vibration and both these matters were not caused by CKK.

In support, CKK pointed out that Dr Pugh had admitted that all significant damage to AA Building had been done by September 1995 when piling works by Falcon were carried out, and that in any event CKK's activities – the construction of pile caps – would not cause any vibrations which would lead to defects being created. Further, Mr Constantinou had testified that CKK had driven sheet piles and grout mixed piles to strengthen the marine clay soil before the excavation. He had also confirmed that all damage seen in August 1996 was repaired in December 1996. Finally, Dr Pugh had stated that once he had had the benefit of the post commencement of construction surveys, he believed that the overwhelming majority of the damage was caused by the subsidence that occurred during the initial piling work and also that the ongoing settlement from 1995 up to the time of the trial could cause the widening of the cracks.

110 I accept CKK's submissions that the plaintiffs have not proved either that CKK was negligent in the way they carried out their works or, that, on the balance of probabilities, any damage that occurred while CKK was on the site on the first occasion resulted from CKK's works. The evidence given by Mr Goh and Mr Constantinou shows that CKK did take precautionary measures to prevent their works from causing damage to AA Building. Secondly, the type of excavation work they did was not, in Dr Pugh's opinion, capable of causing vibration damage.

Damage caused by CKK from 12 August 1998 to 1999/2000

111 Mr Goh's testimony was that the site was handed over to CKK for the second time on 12 August 1998. In his affidavit, he said that CKK commenced excavation work on or around 1 September 1998 and the main building works continued until the temporary occupation permit was obtained on 1 November 2000. Under cross-examination by counsel for CKK, Mr Goh stated that the excavation work that started in September 1998 also involved the moving away of earth from pile caps and this was done manually. There was no evidence during this period of any excavation carried out by machine as Mr Constantinou's evidence related to the earlier period only. I hold CKK's presence at the site during the material time has been established in evidence.

112 The plaintiffs submitted that the damage that occurred to AA Building as a result of CKK's work during this second period was documented and evidenced by the following:

(1) the minutes of a meeting on 10 August 1999 which recorded that noise and vibration had been created by CKK's activities and tenants of AA Building had complained about these matters.

(2) a letter dated 13 June 2000 sent by the plaintiffs to CKK placing on record the meeting between their respective personnel with regard to damage to the metal roof at the fifth level of AA Building caused by objects which had fallen from the site, a letter dated 27 July 2000 from CKK to the plaintiffs in which they stated that they had appointed a contractor to repair the zinc roof on Monday, 31st July 2000 and a letter dated 10 April 2001 from the plaintiffs to CKK stating that as construction activities had been completed, it was then time for the damaged zinc roof to be made good.

(3) a letter dated 20 March 2000 from the Building Control Authority detailing steps that DE Consultants reported they would take to prevent objects from falling onto AA Building from the new building on the site.

113 The plaintiffs also submitted that evidence of damage during the second period was proved by a statement by Dr Soh whilst cross-examination that some time between 1997 and 1998, there was some ground movement and CKK was able to tighten the scaffolds a little bit which meant that there had been a few millimetres of soil movement.

114 Finally, two core samples had been found on the roof of AA Building and Mr Casimir gave it as his opinion that the core samples came from a hole shown in a photograph of that roof. In his opinion, CKK was probably responsible for the hole because the coring occurred near the completion of the new building and it could not have occurred during the demolition works or the subsequent piling work.

115 CKK submitted that there was no direct evidence that they were the cause of the alleged damage at the rear roof. There appeared to be some evidence of damage in the correspondence but the cause of it was in question. Any commitment to repair by CKK in the correspondence appeared to be purely out of goodwill and that repair appeared to have been carried out. Some of the letters relied on by the plaintiffs could not be treated as admissible evidence as the makers had not been called as witnesses. I consider, however, that that submission could not undermine the admissibility and contents of the plaintiffs' letter of 13 June 2000 stating the events that had occurred and written by Ms Chiang and referring to a meeting between CKK's representatives and Mr Tan Chin Hoon. This letter was not controverted by any oral or documentary evidence from CKK. They could have cross-examined Ms Chiang and Mr Tan on the point but did not. Further, in my judgment, CKK's letter of 27 July 2000 stating that they had appointed a contractor to repair the zinc roof was an admission of liability. There was nothing in the letter to indicate they were agreeing to carry out the repairs only as a gesture of goodwill. Nor did they adduce any other evidence to establish this point. I find that CKK's works did cause damage to the rear roof of AA Building in June 2000 as alleged. As for the assertion that this damage had been repaired, no evidence was adduced by CKK to show that that had been done.

116 As regard the discarded core samples, CKK submitted that the plaintiffs had failed to prove that these emanated from CKK. Even if they did, the plaintiffs' claim regarding the presence of core samples was a trivial one. There was little direct evidence that the core samples were discarded on the roof of AA Building by CKK. Even Mr Casimir was making an inference based on the fact that coring could not have occurred during the demolition or piling works. It was not shown that CKK had carried out coring and why they would have wanted to do so. I agree that, as submitted by CKK, no loss seems to have been caused to the plaintiffs by the presence of the core samples. Ms Chiang's evidence was that she did not know what the core samples were or who left them there though she believed that they had something to do with 57 Robinson Road. These core samples had been removed from the roof by the plaintiffs and Ms Chiang stated that the issue of the core samples had been brought up simply to show how CKK had treated AA Building. Even if CKK left the core samples on AA Building it is frivolous to sue them for it.

117 In the result, the only damage to AA Building caused by CKK during this period that the plaintiffs have been able to prove is the damage to the zinc roof.

Liability of Da Zhong for damage done by Trevi and CKK

118 The plaintiffs submitted that Da Zhong was liable for all the damage occasioned by the work

of Trevi and CKK. I cannot accept this submission. As a matter of fact, it has not been proved that Trevi caused damage or that they were negligent. So there is no case against Da Zhong in this respect. In relation to CKK, the only damage that the plaintiffs have been able to prove is the damage to the roof. At that time, CKK had been appointed by FCAL. Da Zhong was no longer the employer. Even if Da Zhong had been the employer, CKK was an independent contractor and Da Zhong could not be made responsible for the negligent action which resulted in the roof being damaged by falling objects while CKK was constructing the superstructure. The fact that Da Zhong had a project manager on site did not give them control over the way CKK did their work so as to imbue Da Zhong with vicarious liability for any negligence on the part of CKK, their workers or subcontractors.

Heads of damage claimed by the plaintiffs

119 In paragraph 29 and schedule B of the statement of claim, the plaintiffs set out particulars of the loss and damage they had sustained. These included:

(1) expenses to be incurred to repair and rectify the subsidence of the corner column at the rear of the building;

(2) expenses to be incurred to repair and rectify the 22K v sub-station concrete plinth and slab;

(3) expenses to be incurred to repair and rectify all cracks on all walls and floors;

(4) expenses to be incurred to repair the damaged metal roof;

(5) expenses to be incurred to repair the apron drains which had subsided;

(6) expenses to be incurred to rectify all unsuccessful repairs; to restore all vertical and horizontal surfaces to their original condition; to restore all damaged finishes and damaged surfaces and to repair all areas of water ingress and distorted openings;

(7) expenses to be incurred in making good the withdrawal of the right of support and all 'affectations' to the plaintiffs' premises;

(8) all loss suffered by ways of the plaintiffs' management's time in dealing with the damage, vibrations and noise arising from the demolition and/or construction activities; and

(9) loss of rental from certain units in the premises.

It appeared clear from the particulars set out in sub-paragraphs (1) to (7) above that the plaintiffs were seeking as damages the costs that they would incur in rectifying AA Building so as to restore it to its original condition.

120 By paragraph 30 the plaintiffs averred that they had suffered special damage as a result of having to engage the services of experts including building surveyors to inspect their premises and to verify the extent of damage to their premises.

(i) General damages: damage to the building

121 The first point is on what basis the damages sustained by the plaintiffs as a result of the damage inflicted on the building as a whole should be assessed.

122 The plaintiffs contended that they had provided the court with expert evidence on the costs that would be involved depending on whether they adopted the option of demolishing and rebuilding the annex (the rebuild option) or adopted the option of totally rectifying the defects and damage found in AA Building (the repair option). The rebuild option was estimated by Mr Casimir to cost approximately $2.007 million. He estimated that the repair option would cost approximately $2.35 million. The plaintiffs submitted that the figures given by Mr Casimir were reasonable given the circumstances as it was apparent from the evidence that minor repairs would not make good the damage. They said there was a compelling need for serious soil investigations to be undertaken by professionals and for a full structural investigation to be carried out. The plaintiffs did not state expressly which option they preferred the court to choose as the basis of assessing damages. What they wanted was that one of the options be chosen and along with it the estimations given by Mr Casimir be accepted. They further submitted that the loss of rental occasioned by the works had to be assessed against the defendants whichever option was chosen.

123 The defendants submitted that the plaintiffs had changed course by asking the court to consider the rebuild option. A reasonable and logical reading of the plaintiffs' pleaded case would lead to the conclusion that the plaintiffs were claiming rectification costs since, in their statement of claim the plaintiffs had taken pains to itemise each item of damage caused to the building. There was no hint of a claim for demolition and rebuilding anywhere in the pleadings. At no time before the exchange of the affidavits of evidence-in-chief did the plaintiffs inform any of the defendants that they wanted compensation for the costs of demolition/rebuilding. Some time before the filing of the affidavits, however, the plaintiffs changed their mind and tried to steer the claim into one for demolition and rebuilding without having to amend the statement of claim. The defendants submitted that the plaintiffs should not be allowed to persuade the court to accept the rebuild option as that was not their pleaded case.

124 The defendants noted that in the closing submission, the plaintiffs had retreated from the rebuild option and had put forward both that and the repair option. One thing, however, was clear, and that was that the plaintiffs were not interested in the damages being assessed on the basis of the diminution in value of AA Building. The defendants submitted that this was the correct basis on which damages should be assessed because of events that had occurred subsequent to the commencement of the option.

125 These events are as follows. The plaintiffs disclosed in the course of the trial that on 18 March 2002, the Court of Appeal had made a consent order in Civil Appeal No. 600066 of 2001 and Civil Appeal No. 600067 of 2001. These appeals arose out of Originating Summons no. 727 of 1996, a High Court action between two groups of individuals who are shareholders in the plaintiff company as to the value of various assets owned by them, including the plaintiff company. The plaintiffs themselves were also a party to CA No. 600067 of 2001 and to OS 727 of 1996. The consent order made by the Court of Appeal provided, inter alia, that AA Building, certain shares in Ssangyong Cement Limited, and a rubber plantation in Indonesia, be sold forthwith. It also provided that in respect of the sale of AA Building the net proceeds of sale be divided equally between the two groups of shareholders.

126 On 10 April 2002, after the plaintiffs had adduced all their evidence in this action, their counsel requested that the hearing be adjourned and further hearing dates be reserved until after the sale of AA Building as provided for in the Court of Appeal order. The plaintiffs then expected that the sale would be completed within a period of between five weeks and three months. The sale did not, however, take place as expected. The trial therefore resumed in September 2002. Further orders were made by the Court of Appeal in July 2002 and January 2003 to deal with the difficulties that had arisen in implementing the 18th March 2002 order but the subsequent orders did not vary or set aside

the direction in the original order that AA Building was to be sold forthwith.

127 On the foregoing facts, the following submissions were made. First, that the order was a consent order made between the controlling parties of the plaintiffs. When these controlling parties sealed their consent to the sale forthwith of the building under an order of court, it was clear that they had no intention of rectifying the building or of demolishing and rebuilding it. The order that they consented to was for AA Building to be sold forthwith in its existing state, and not in any demolished and reconstructed (and thereby enhanced) state. If the court were now to order that the annex was to be demolished and rebuilt or that the whole building was to be rectified, a lengthy period of time would be required to effect such order. This would put the parties controlling the plaintiffs in breach of the order of court which required the sale to be made forthwith ie as soon as practicable.

128 The first three defendants submitted that the plaintiffs were not concerned with the demolition and rebuilding of the annex or with the rectification of the whole building. The real opportunity lies in the land on which the building stands. The plaintiffs had, in April 1995, submitted and obtained provisional planning permission for the redevelopment of their premises. AA Building has a prime location and is surrounded by redeveloped properties. The site has huge redevelopment potential. In the circumstances, rectification is immaterial to the appreciation of the value of AA Building and rectification ought not to be the measure in which the plaintiffs are entitled to damages upon. They further submitted that the dispute between the plaintiffs' shareholders had commenced early on and the parties must have known that AA Building would be sold no matter what for the dispute to be resolved and to allow them to part ways. Any order now relating to rectification or demolition/rebuilding would be inconsistent with the order of court which has required the sale of AA Building. To award the plaintiffs substantial damages for the heads they seek would be to enable them to profit and obtain a windfall and it would be unjust against the defendants to allow the plaintiffs to benefit in this way. The plaintiffs, at the very best, would only be entitled to nominal damages.

129 In their reply to the defendants' submissions, the plaintiffs argued strongly that damages should be awarded on the basis of the rebuild option. They reiterated the evidence of Dr Pugh that the building was not sound in the long term although it was not liable to fall down any time soon and his conviction that they were entitled to a building that was as sound as AA Building had been before the works started and that this could only be achieved by demolishing and rebuilding the annex. Any partial repairs along the lines of those recommended by Mr Tan Si Jue would leave the annex in its distorted or deformed shape. They pointed out that regard had to be given to the fact that the supports inserted by Falcon were meant to be temporary and to be removed when the first floor of Robinson Centre was completed. The plaintiffs had prayed for the removal of these supports and were entitled to do so in the same way that any house-owner was entitled to demand that all intrusions on his property be removed. As regards the Court of Appeal order, they submitted that it was for the benefit of the owners of AA Building. It was not for the benefit of the defendants who had caused damage to the building but sought to abuse the court's order as a shelter against the lawful claim clearly established from their own documents. All the arguments made about the plaintiffs trying to get cash before the building was sold or that rectification was unnecessary had no legal foundation. A plaintiff whose land and building has been affected is entitled to be compensated for the damage. He may apply the money for repairs or he may not. In this instance, the plaintiffs would wish to apply the quantum awarded to the building. The building when sold (if that ever came to pass) would certainly fetch a value in keeping with its state before all the works of the defendants started.

1 3 0 *McGregor on Damages* (16th Ed, 1997) discusses between ¶1474 and ¶1479 the correct measure of damages in a case where land has been damaged. It points out that whilst for a long time

it was considered that the normal measure of damages was the amount of diminution of the value of the land, since *Hollebone v Midhurst and Fernhurst Builders* [1968] 1 LLR 38, the cost of replacement or repair has been considered to be the normal measure. However, the cost of reinstatement is not always allowed. For example, it has been disallowed in situations where it was not contemplated or where it was not practical or sensible to reinstate. Reinstatement may also be rejected as an appropriate measure because it is out of all proportion to the injury to the plaintiff. At ¶1480 *McGregor* has this to say as to which measure should be chosen:

> The difficulty in deciding between diminution in value and cost of reinstatement arises from the fact that the plaintiff may want his property in the same state as before the commission of the tort but the amount required to effect this may be substantially greater than the amount by which the value of the property has been diminished. The test which appears to be the appropriate one is the reasonableness of the plaintiff's desire to reinstate the property; this will be judged in part by the advantages to him of reinstatement in relation to the extra cost to the defendant in having to pay damages for reinstatement rather than damages calculated by the diminution in value of the land. That reasonableness is the criterion is well brought out by *Lodge Holes Colliery Co v Wednesbury Corporation*, where the court gave neither the amount of the diminution in value nor the expense incurred in reinstatement but awarded the cost of a partial and limited replacement. In that case the defendant, while working a mine under the highway, let down its surface, which the plaintiff local authority, bona fide and on the opinion of skilled advisers, restored to its former level at great cost, although an equally commodious road might have been made more cheaply. It was held that the plaintiffs were only entitled to recover the lesser cost. Lord Loreburn L.C., delivering the leading speech, pointed out that a court should be "very slow in countenancing any attempt by a wrongdoer to make captious objections to the methods by which those whom he has injured have sought to repair the injury", and that "in judging whether they [ie the plaintiffs] have acted reasonably, I think a court should be very indulgent and always bear in mind who was to blame". Nevertheless
>
> > "the point of law which was advanced by the plaintiffs, namely that they were entitled to raise the road to the old level, cost what it might and whether it was more commodious to the public or not, will not, in my opinion, bear investigation. Such a rule might lead to a ruinous and wholly unnecessary outlay."

131 I am also guided by Donaldson LJ's observation in *Dodd Properties v Canterbury City Council* [1980] 1 All ER 928 at p 938 where he said:

> The general object underlying the rules for the assessment of damages is, so far as is possible by means of a monetary award, to place the plaintiff in the position which he would have occupied if he had not suffered the wrong complained of, be that wrong a tort or breach of contract. In the case of a tort causing damage to real property, this object is achieved by the application of one or other of two quite different measures of damage, or, occasionally, a combination of the two. The first is to take the capital value of the property in an undamaged state and to compare it with its value in a damaged state. The second is to take the cost of repair or reinstatement. Which is appropriate will depend on a number of factors, such as the plaintiff's future intentions as to the use of the property and the reasonableness of those intentions. If he reasonably intends to sell the property in its damaged state, clearly the diminution in capital value is the true measure of damage. If he reasonably intends to continue to occupy it and to repair the damage, clearly the cost of repairs is the true measure. And there may be in-between situations.

132 In the present instance, if the plaintiffs had carried out repairs to the building before the case started or if I had had to decide this issue before 18 March 2002, I would have held that the damages

payable by the first to third defendants must be assessed on the basis of reinstatement of AA Building. The situation changed, however, when the shareholders agreed on terms for the resolution of their dispute. They then consented to an order by the Court of Appeal that included an order that AA Building be sold forthwith. Whilst up to date the sale of AA Building has not, as far as I am aware, been effected, it is clear from that order and from the circumstances that led to it being made that the building will be sold within the foreseeable future. The plaintiffs have no choice but to sell the building. It is also relevant that the plaintiff company occupied the building throughout the period of the construction works and right up to the end of the trial and did not indicate any intention of vacating it. The building was also occupied by various tenants including the firm acting as solicitors for the plaintiffs in this action and, whilst there has been a claim for loss of rental, that claim is confined to specific units for specific periods. In all the circumstances, it appears that it is practicable for the plaintiffs and their tenants to go on using the building in its un-repaired state until it is sold. Therefore, it would not really be practicable or sensible for major work to be done on AA Building. Such work will not have a significant effect on the income that can be earned from the building in the short period before it is sold. It would not be reasonable for the plaintiffs to insist on reinstating the building before selling it.

133 On the facts before me, I consider that the damages payable by the first to third defendants for the damage caused to AA Building should be assessed on the basis of the diminution of the capital value of AA Building as at the date of this judgment ie what the price of the building would be if it was sold on the date of this judgment in an undamaged condition as opposed to the price it could expect to fetch on the same day in its present condition. I do not think it is correct to order nominal damages. Obviously, substantial damage has been sustained and this most probably, would have a more than nominal effect on the price of the building even though much of the value of the site on which AA Building stands may reside in its development potential. I also think it correct to send this issue for assessment as the trial was ordered to be on the liability issue only and the issue of whether the diminution in value basis for the assessment of damages was the correct one only arose in the course of the trial.

134 The plaintiffs also asked for exemplary damages to be ordered against the defendants. I do not need to deal with their submissions in detail as the categories of situations in which the law allows for an award of exemplary damages are very limited and the present case does not fall within any of those categories as established by *Rookes v Barnard* [1964] AC 1129. I must decline the plaintiffs' invitation to reject *Rookes v Barnard* which to the best of my knowledge is good law in Singapore even though other commonwealth countries have taken a different approach to the issue.

135 The plaintiffs have also claimed damages for trespass in respect of the supports which the first three defendants erected to strengthen the stability of AA Building. They point out that in various items of correspondence, these supports were referred to as being temporary but to-date, none of them has been removed. I decline to make an award of damages for trespass. The plaintiffs consented to the erecting of the various supports and therefore no acts of trespass were committed by their erection. Secondly, no harm has been accorded to the plaintiffs or AA Building by the scaffolding which was built at the side of AA Building and has now been covered by Robinson Centre. Thirdly, as far as the scaffolding within the sub-station and at the rear façade facing Boon Tat Link are concerned, whilst these would have had to be removed when the building was reinstated and the plaintiffs would have recovered the cost of doing so, since the building is now to be sold in its present condition, any adverse effect these structures might have on the value of the building will be reflected in the award made for diminution of value.

(ii) General damages: loss of rental

136 The plaintiffs are claiming loss of rental for units 01-01, 06-02, 03-03, 03-15, 03-11 and 04-03A. The evidence on this claim was given by Mr Tan Chin Hoon. Generally, the plaintiffs' stand was that the noise and vibration arising from the defendants' works made it difficult to rent out these various units. In specific cases, damage caused to the units by the works made it impossible to rent out those units.

137 I will deal with the claims unit by unit. For unit 01-01, the claim is for the period from 30 April 1996 to 1 September 1997. The tenant who left in 1996 paid rent of $9,000 a month and the tenant who came in in September 1997 paid $6,460 per month in rent. The plaintiffs estimated their loss of rental as being $103,360 if rental for the vacant period was calculated on the basis of $6,460 per month and $144,000 if it was calculated on the basis of $9,000 a month. In cross-examination, Mr Tan accepted that from 12 July 1996 the second and third defendants could not be liable for noise and vibration because they were no longer at the site. I think this claim is not sustainable for two reasons. First, the unit was not damaged by OHK and Falcon's works and even though there may have been some amount of noise and vibration between 30 April 1996 and 12 July 1996, there is no evidence that this was beyond what is generally experienced when construction work takes place in the city. Unfortunately, occupants of office buildings in Singapore have to live with a certain amount of noise when construction work takes place in the vicinity. Secondly, the vibrations if any which were felt during this period cannot have been very strong since the sheet-piling had already been put in place and no substantial damage was done to AA Building during that period. Some cracks did appear but these were slight and were probably due to ongoing settlement rather than vibrations. Whilst the rentability of the unit might have been affected by the unit's proximity to a building site, this is something which I think owners of buildings have to put up with. There was no evidence whether from any prospective tenant or any real estate agent that the unit remained vacant because the works going on at the site were unusually noisy or caused unusual vibrations. There is no evidence either that the noise or the vibrations resulted from negligence in the way the construction activities were carried out.

138 In respect of unit 06-02, the plaintiffs claim loss of rental for the period from 1 June 1999 till 30 May 2001. This claim has nothing to do with Falcon or OHK as neither was on the site at the time. It was CKK who was on the site but their work during that period was limited to the superstructure and could not have caused any vibrations. There was no evidence of excessive noise created by CKK. At the material time, work was also taking place on the Kajima site and the plaintiffs had from time to time issued strong complaints about noise and vibrations from that site. The plaintiffs have not proved that any of the defendants in this case was responsible for this alleged loss of rental from unit 06-02.

139 For units 03-03, 03-11 and 03-15, loss of rental is claimed from 1 August 1996 onwards because they were not rentable due to crack defects caused by OHK and Falcon's works. Unit 03-11 in particular was badly affected because of the existence of water seepage. Mr Constantinou testified that he was shown damage in these three units. Whilst he very much doubted that the water seepage and the cracks seen were due to Falcon's works, repair works were carried out in December 1996. I accept his evidence. The plaintiffs' claim for loss of rental must therefore be limited to the period between 1 August 1996 and 31 January 1997 (giving the plaintiffs an extra month to find tenants after the repairs were completed). The plaintiffs produced tenancy agreements showing rental of $3,100 per month for unit 03-11 and $5,940 per month for units 03-03 and 03-15 on a combined basis. This means the total loss of income for three units was $9,040 per month giving them a loss of $54,240 for the six-month period.

140 Finally, for unit 04-03A the plaintiffs claim loss of rental for the period from 1 February 1996 to 31 December 1998. Their claim was that this was a unit carved out of unit 04-03. The whole of

unit 04-03 was not tenantable because one corner of the office had sunk and there were excessive cracks on the wall. Eventually, the plaintiffs managed to let a portion of this unit as unit 04-03A to their solicitors who had adjoining offices. The new unit was very small (450 sq ft only) and could not otherwise have been rented out on its own. As the difficulty in renting out unit 04-03 as a whole arose from damage to the unit caused by OHK and Falcon's works, they are liable for this claim for this small part of the damaged unit. The plaintiffs omitted by accident, to make a claim for the rest of unit 04-03. In January 1996, tenants paid $3.50 per sq ft for unit 04-03 and in January 1999, Manjit & Partners paid $3.30 per sq ft for unit 04-03. Taking the lower figure, this means that the plaintiffs lost $3.30 per sq ft or $1,485 per month for unit 04-03A during the period from February to December 1998 giving a total of $51,975 as lost rental.

Special damages

141 The plaintiffs produced a number of invoices and said that these were bills for services that they had to incur by reason of the defendants' wrongdoing. The defendants have challenged the plaintiffs' entitlement to most of these claims on the basis that the invoices were not explained or that the work that they represent was not attributable to any fault on the part of the defendants or that the plaintiffs were not entitled to incur these expenses. I will first of all set out the invoices where I consider that the plaintiffs acted reasonably in incurring these expenses and where these expenses were necessitated by the damage done to AA Building by the first to third defendants' works. Thereafter I will deal with invoices which I think cannot be claimed as special damages.

142 The invoices that I accept are those from:

(1) Tang Tuck Kim Registered Surveyor dated 9 November 1995 for $1,133;

(2) Moh & Associates (S) Pte Ltd dated 13 November 1995 for $2,338.10;

(3) Tang Tuck Kim Registered Surveyor dated 14 December 1998 for $309;

(4) Meinhardt dated 11 December 1995 for $9,476;

(5) Moh & Associates (S) Pte Ltd dated 28 December 1995 for $339.90;

(6) Moh & Associates (S) Pte Ltd dated 7 February 1996 for $2,286.60;

(7) Moh & Associates (S) Pte Ltd dated 14 March 1996 for $762.20;

(8) Moh & Associates (S) Pte Ltd dated 2 April 1996 for $339.90;

(9) Ruby General Services dated 17 April 1996 in respect of minor repair works for unit 03-03 for $1,545;

(10) Ruby General Services dated 18 May 1996 in respect of repair works for $1,751;

(11) Moh & Associates (S) Pte Ltd dated 12 September 1996 for $339.90;

(12) Meinhardt dated 24 February 1997 for $2,832.50;

(13) Besco Enterprise dated 14 August 1998 in respect of the dismantling of damaged windows and the installation of new windows for $2,754;

(14) Besco Enterprise dated 14 August 1998 in respect of similar works for $1,050; and

(15) $1,200 from Monarch International Pte Ltd's invoice dated 26 June 1998.

These total $28,457.10.

143 The invoices that I have not accepted as constituting special damages and my reasons for that non-acceptance are set out briefly hereafter:

(1) Murphy & Dunbar's bill of 12 December 1995 for $3,090 – these are legal fees and cannot be claimed as special damages though they may possibly be claimed on taxation of costs;

(2) Gnee Shing's undated invoice no. 1354 for $2,000 paid by the plaintiffs in October 1996 for repairs to the roof gutter pipe. This has not been sufficiently proved to relate to works undertaken because of damage inflicted by OHK and/or Falcon;

(3) Meinhardt's invoices dated 24 September 1997 and 16 January 1998 relating to work on the sub-station as it has not been explained how much of the charges relate to the rectification of damage caused by the defendants' work and how much relate to other work which PUB required the plaintiffs to do in the sub-station to enhance it and improve the transformer plinths;

(4) except for the sum of $1,200 which is included in item (15) of ¶ 140 above, Monarch International Pte Ltd's invoice dated 26 June 1998 relating to work done in the sub-station is rejected as it has not been properly explained and it appears that most of the work billed for was required by the PUB and did not arise from the damage;

(5) Meinhardt's invoices dated 2 July 1998 and 3 August 1998 as these relate to professional services given for potential litigation and therefore should be claimed, if at all, on taxation;

(6) Chuan Kiat & Company's invoice dated 10 August 1998 which apparently relates to the gable wall of the 7-storey building and if so, as Ms Chiang agreed, the gable wall was the plaintiffs' own responsibility and the repair work cannot be charged to the defendants and in any case it has not been proved that the works done as described in this invoice resulted from damage caused by them;

(7) Moh & Associates (S) Pte Ltd's invoices dated 1 April 1999 and 12 June 2001 as the plaintiffs have not explained why it was necessary to continue monitoring work in 1998 or 1999 (it is not clear from the invoice when the work was done) and 2001 when these dates were long after the rectification works carried out by the defendants;

(8) Wong Partnership's invoice dated 12 October 2000 as this should be claimed, if at all, on taxation;

(9) Uni-Associated Consultants' invoice dated 10 May 2001 as these were services rendered for the purpose of litigation and should be claimed, if at all, on taxation;

(10) all invoices from CC Building Surveyors and Weeks Consulting Ltd as these were services rendered for the purpose of litigation and should be claimed, if at all, on taxation; and

(11) W S Surveys Pte Ltd's invoice dated 13 August 2001 as first I do not know what exactly this is for and secondly, it may relate to the litigation and therefore should be claimed, if at all, on taxation.

Conclusion

144 For the reasons given above, there shall be judgment for the plaintiffs against the first, second and third defendants for:

(1) general damages to be assessed on the basis of the diminution in value of AA Building by reason of the damage caused by the construction works carried out by these defendants;

(2) the sum of $106,215 as loss of rental;

(3) the sum of $28,457.10 as special damages for expenses incurred; and

(4) costs of the plaintiffs' action against these three defendants.

145 The plaintiffs' claim against the fourth defendants is dismissed. I am not making a costs order at this stage, however, as I think the fourth defendants may have to bear some of the costs incurred by the plaintiffs in preparing to cross-examine the fourth defendants' witnesses. I will hear the parties on costs.

146 As regards the fifth defendants, the only damage proved was to the zinc roof. No repairs of the roof appear to have been carried out to-date. Mr Casimir estimated that repairing the roof would cost about $25,000. Since the roof has not been repaired since June 2000 and the building is shortly to be sold, it would seem to be pointless to carry out repairs to it now and therefore the damages payable by the fifth defendants for this item should be assessed on the basis of the diminution in value of the building caused by the damage to the roof. There will therefore be judgment for the plaintiffs against the fifth defendants for damages to be assessed. It is, however, unlikely that the building's value will have been diminished by more than $25,000 (ie the cost of repairs which is the other measure of damages) by reason of the damage to the roof. On that basis, this action against the fifth defendants should have been brought by the plaintiffs in the Magistrates' Court. It would not be right to award the plaintiffs the full costs of the action against the fifth defendants and it may even be appropriate to award the costs of defending the action to the fifth defendants. I shall hear the parties on costs.

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