Court of Appeal
Supreme Court

New South Wales

Case Name:	Owners of Strata Plan No 30791 v Southern Cross Constructions (ACT) Pty Ltd (in liquidation)
Medium Neutral Citation:	[2020] NSWCA 199
Hearing Date(s):	24 and 25 March 2020
Date of Orders:	31 August 2020
Decision Date:	31 August 2020
Before:	Gleeson JA at [1]; McCallum JA at [2]; Emmett AJA at [3]
Decision:	Order that:

1. Appeal as against the first and second respondents allowed in part, insofar as the primary judge dismissed the plaintiffs' claim against the first and third defendants.

2. Appeal as against the third respondent dismissed.

3. Appellants to pay the third respondent's costs of the appeal.

4. As to the remaining questions of (a) the first and second respondents' defence based on the proportionate liability provisions of the Civil Liability Act 2002 (NSW) and (b) costs of the proceedings below and in this Court, direct that:

(i) the first and second respondents file and serve short written submissions on or before 14 September 2020;

(ii) the appellants file and serve short written submissions in response on or before 28 September 2020;

(iii) the first and second respondents file and serve any short written submissions in reply on or before 12 October 2020.

5. Subject to consideration of any application for a further oral hearing, which should be made in the written submissions referred to in order 4, the remaining questions be dealt with on the papers.

Catchwords:	BUILDING AND CONSTRUCTION — Negligence — Miscellaneous forms of negligent conduct — Right of support — Application of Conveyancing Act 1919 (NSW) s 177 and common law — Whether loss of support caused damage to adjoining property. TORTS — Negligence — Essentials of action for negligence — Whether there was a failure to take reasonable care — Whether any failure caused damage — Assessment of expert evidence. TORTS — Negligence — Proof of negligence — Res ipsa loquitur.
Legislation Cited:	Civil Liability Act 2002 (NSW) ss 5D and 5E Civil Liability (Third Party Claims Against Insurers) Act 2017 (NSW) Conveyancing Act 1919 (NSW) s 177 Corporations Act 2001 (Cth)
Cases Cited:	Strong v Woolworths Limited (2012) 246 CLR 182; [2012] HCA 5 Suttor v Gundowda Pty Ltd (1950) 81 CLR 418; [1950] HCA 35
Texts Cited:	Nil
Category:	Principal judgment
Parties:	The Owners – Strata Plan No. 30791 (First Appellant) Albert Bonansea and Ivana Bonansea (Second Appellant) Angus John Nicholas Brooks (Third Appellant)

	Julius Wolfgang (Fourth Appellant) Roslyn Bainton (Fifth Appellant) Michelle Anne Carruthers (Sixth Appellant) Alison Jean Pate (Seventh Appellant) Vanessa Claire Winley (Eighth Appellant) Southern Cross Constructions (ACT) Pty Ltd (ACN 111 121 450) (In Liquidation) (First Respondent) Allianz Australia Insurance Limited (ACN 000 122 850) (Second Respondent) Hughes Trueman Pty Ltd (ACN 003 330 783) (Third Respondent)
Representation:	Counsel: B Walker SC with A Oakes (Appellants) A Moses SC with S Blackman (First and Second Respondents) D Hand (Third Respondent) Solicitors: Holman Webb Lawyers (Appellants) Thompson Cooper Lawyers (First and Second Respondents) Clyde & Co Australia (Third Respondent)
File Number(s):	2019/150753
Publication Restriction:	Nil
Decision under appeal:	
Court or Tribunal:	Supreme Court of New South Wales
Jurisdiction:	Equity – Technology and Construction List
Citation:	[2019] NSWSC 440 (Substantive); [2019] NSWSC 560 (Costs)
Date of Decision:	16 May 2019
Before:	Stevenson J
File Number(s):	2013/179839

[Note: The Uniform Civil Procedure Rules 2005 provide (Rule 36.11) that unless the Court otherwise orders, a judgment or order is taken to be entered when it is

recorded in the Court's computerised court record system. Setting aside and variation of judgments or orders is dealt with by Rules 36.15, 36.16, 36.17 and 36.18. Parties should in particular note the time limit of fourteen days in Rule 36.16.]

HEADNOTE

[This headnote is not to be read as part of the judgment]

In 2010, building works on a development project led to movements of the foundation strata below an uphill adjoining property (**the Affected Property**), causing extensive damage to an apartment building situated on the Affected Property. The owners' corporation from the damaged building commenced proceedings against a variety of engineers, construction contractors and other parties connected to the development, but many of those claims settled. Proceedings continued against Southern Cross Constructions (**the Builder**) and Hughes Truman (**Hughes**), a structural engineering firm.

The building works involved extensive excavations. A concrete retaining wall supported the Affected Property (**the Retaining Wall**). To support that wall and the Affected Property during the excavation, the design of the development project provided for the construction of a "shoring wall" made up of contiguous concrete piles (**the Shoring Wall**). Although Hughes performed the structural engineering for the development building, the design of the Shoring Wall was ultimately performed by a different engineer. The Builder was responsible for the carrying out and subcontracting of the building and excavation works.

Expert evidence indicated that the movement of the foundation strata below the Affected Property caused the relevant damage. Further, the movement of the strata was caused by movements of both the Shoring and Retaining Walls. The experts attributed the Shoring Wall movement to inadequate wall design, the removal and replacement of steel props used to support the Shoring Wall and excavations for a lift pit and other foundations for the development. They attributed the Retaining Wall movement to the Shoring Wall movements and inadequate support of the Retaining Wall.

The appellants alleged that each of Southern Cross and Hughes acted in breach of the duties of care owed at common law and under the *Conveyancing Act 1919* (NSW) s 177 and that they suffered damage as a result. The

appellants alleged the Builder was negligent with respect to the excavations and the construction of the Shoring Wall. As against Hughes, the allegations of negligence related to their structural designs failing to properly accommodate the design of Shoring Wall. A judge of the Supreme Court determined that neither was liable for any of the damage. As against the Builder, the primary judge did not accept that the Builder's actions could have been said to have caused the relevant damage. As against Hughes, the evidence did not disclose that their designs caused any damage.

The principal issues before the Court were:

i) Whether the primary judge erred in failing to find that the Builder was liable for the damage caused to the building.

ii) Whether the primary judge erred in failing to find that Hughes was liable for the damage caused to the building.

iii) Whether the primary judge generally erred in his approach to causation and in failing to apply the doctrine of *res ipsa loquitur.*

The Court, allowing the appeal in part (Gleeson JA at [1], McCallum JA at [2] and Emmett AJA at [277]), **held:**

As to issue (i), per Emmett AJA (Gleeson JA and McCallum JA agreeing):

1. The primary judge erred in finding the Builder was not negligent in directing excavations in the vicinity of the Retaining Wall. That excavation removed support for the Retaining Wall without first ensuring adequate support was in place for the Affected Property and was done so contrary to geotechnical engineering advice. While the expert evidence before the primary judge did not expressly indicate the excavation caused movement to the foundation strata, that conclusion was a necessary incident of the opinion that inadequate propping of the Retaining Wall was a cause of the movement to the foundation strata: at [178]–[199].

2. The Builder was not negligent in directing excavations for foundation piles and a lift pit as it was entitled to rely on the Shoring Wall being adequate to support those excavations: at [200]–[209].

3. The Builder may have been obliged under the development approval to retain its own independent geotechnical engineer, however, the evidence did not establish that doing so would have prevented the damage to the Affected Property: at [210]–[225].

4. The Builder's failure to install monitoring points strictly in accordance with a pre-established "monitoring plan" could not be said to have caused damage as it was speculative as to what the additional monitoring would have revealed and whether it would have led to any action different to that which was undertaken: at [226]–[230].

As to issue (ii), per Emmett AJA (Gleeson JA and McCallum JA agreeing):

5. Hughes was not ultimately responsible for the design of the piling structure around the Northern Light Well which was excavated by the Builder's subcontractor. The construction of that area was completed under plans provided by a different engineer: at [231]–[239].

6. Hughes' original design of the lift shaft did not locate the shaft immediately adjacent to the Shoring Wall. That only occurred after the Shoring Wall design was modified by another engineer. Further, the modified Shoring Wall design was deficient in its failure to provide adequate support for the excavation necessary for the lift pit. These were not failures attributable to Hughes: at [240]–[249].

7. Hughes was not responsible for the incompatibility between its design of the foundation columns, footings and ground floor structures and the subsequently produced Shoring Wall design. The need to remove the props installed to support the modified Shoring Wall in order to allow for the construction of Hughes' foundation piles was a shortcoming in the design of the modified Shoring Wall, not of Hughes' structural design: at [250]–[257].

8. Hughes was not liable in respect of an alleged duty to take investigative action when the project's architect requested information from Hughes in relation to neighbour concerns about cracking. Hughes provided the requested information and was entitled to assume the issue was being dealt with: at [258]–[260].

As to issue (iii), per Emmett AJA (Gleeson JA and McCallum JA agreeing):

9. It was unnecessary to consider the cumulative effect of successive breaches after finding that the only breach was on the part of the Builder. It is unnecessary to consider the contentions based upon *res ipsa loquitur* after finding that the Builder was negligent: at [261]–[276].

JUDGMENT

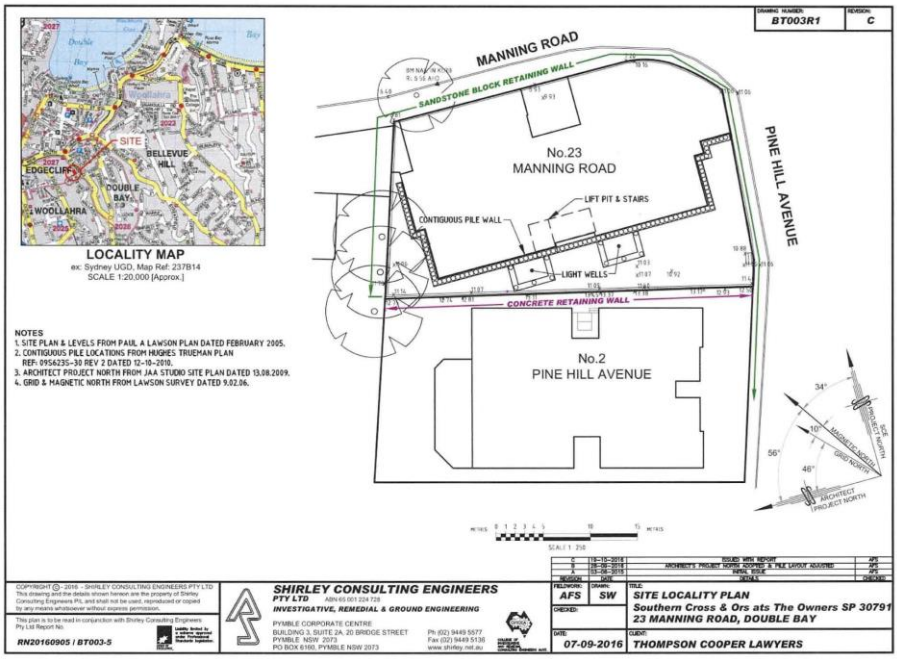
1 **GLEESON JA**: I agree with Emmett AJA.

2 **McCALLUM JA**: I agree with Emmett AJA.

3 **EMMETT AJA:**

Introduction

This appeal arises out of building works carried out between July and November 2010 on land situated on the corner of Manning Road and Pine Hill Avenue, Double Bay (**the Development Property**). The building works resulted in damage to a three-storey block of 12 apartments (**the Building**), which stands on land having a frontage to Pine Hill Avenue (**the Affected Property**), which adjoins the Development Property from the west and uphill. The location of the Building and the Affected Property in relation to the Development Property is shown in the following diagram:



4 The Building was erected on the Affected Property in 1927. The first appellant, the Owners – Strata Plan No. 30791 (**the Owners Corporation**), is the owners' corporation in respect of a strata plan subsequently registered in respect of the Building (**the Strata Plan**). The 2nd to 8th appellants are owners of lots in the Strata Plan (**the Unit Owners**).

5 In 1937, a block of apartments (**the Old Block**) was erected on the Development Property. At the time when the Old Block was erected, a two-metre-high gravity concrete retaining wall, which rose some 2.4 m above the ground level of the Development Property, was constructed on the boundary between the Affected Property and the Development Property (**the Retaining Wall**). The Retaining Wall is labelled "Concrete Retaining Wall" in the plan set out above.[1]

6 At all relevant times, the Development Property was owned by Qiantang Investment Group Property Development Pty Ltd (**the Developer**). The Developer obtained development approval (**the Development Approval**) from Woollahra Municipal Council (**the Council**) for proposed building works on the Development Property, which involved replacing the Old Block with a new block of apartments (**the New Apartment Building**).

Damage to the Affected Property and Procedural Background

7 The Old Block was demolished prior to July 2010 and, between July 2010 and November 2010, work on the Development Property was undertaken by Southern Cross Constructions (ACT) Pty Ltd (**the Builder**), in preparation for the construction of the New Apartment Building. That work consisted, relevantly, of excavation, piling and shoring work around the western boundary of the Development Property, which was adjacent to the Retaining Wall and the Affected Property (**the Shoring Works**). A part of the Shoring Works involved the design and construction of a shoring wall (**the Shoring Wall**), the purpose of which was to provide stability to both the Development Property and the Affected Property during the excavations contemplated for the New Apartment Building.

[1] At [3].

8 The location of the Shoring Wall is labelled “contiguous pile wall” in the plan extracted above.[2] As that label suggests, the Shoring Wall was to be constructed from a number of concrete piles constructed close together. These piles were to be connected together with a “capping beam”, which is a steel or concrete beam that ties a line of piles together and helps to hold back earth and transfers loads from columns or walls erected above the beam into the row of piles below. The capping beam would also create a foundation for a suspended slab that was to form a floor in the finished building. There were three parts to the Shoring Wall: a long straight section, and two shorter sections. One of the shorter sections extends around part of the northern side of the New Apartment Building (**the Northern Return Wall**), and the other extends around part of the southern side (**the Sothern Return Wall**). Also visible in the plan is an area marked out for the lift pit and stairs, which appear on the Development Property in front of the Shoring Wall.

9 The Shoring Works caused movement of the Retaining Wall, which caused the foundation strata under the Building to move. That movement caused cracking and other aesthetic and structural damage to the Building. The cost of rectification of the damage caused to the Building by those movements will be approximately $5 million and the necessary work will take some 66 weeks. The occupants of the Building will need to move while the work is carried out. The cost of temporary relocation is included in the sum of $5 million. In addition, some $500,000 worth of damage has been occasioned to internal structural walls of the Building.

10 The Builder is now in liquidation and leave under the *Civil Liability (Third Party Claims Against Insurers) Act 2017* (NSW) and the *Corporations Act 2001* (Cth) has been granted for the Owners Corporation and the Unit Owners to proceed against the second respondent, Allianz Australia Insurance Ltd, the Builder’s insurer (**the Insurer)**. The Owners Corporation commenced proceedings in the Technology and Construction List of the Equity Division against eight defendants, being the Builder, Pile & Bucket Pty Ltd (**Pile & Bucket**), the Insurer, Northwood Pty Ltd (**Northwood**), Jeffery & Katauskas Pty Ltd (**J&K**), Hughes Trueman Pty Ltd (**Hughes**), NMK (Aust) Pty Ltd (**NMK**) and the

[2] At [3].

insurers of NMK. Those parties were variously involved in the Shoring Works. The Unit Owners were subsequently joined as plaintiffs in those proceedings. The proceedings as against all defendants other than the Builder, the Insurer and Hughes were subsequently settled.

11 On 18 April 2019, for reasons published on that day, a judge of the Equity Division sitting in the Technology and Construction List (**the primary judge**) ordered that the proceedings be dismissed as against the Builder, the Insurer and Hughes. On 16 May 2019, for reasons published on that day, the primary judge ordered the Owners Corporation and Unit Owners to pay the costs of the Builder and the Insurer on the ordinary basis up to 31 July 2018 and on the indemnity basis from 1 August 2018 onwards, excluding certain costs of an application in relation to the adoption of a referee's report. His Honour ordered the Owners Corporation and Unit Owners to pay the costs of Hughes on the ordinary basis with no exclusion. His Honour ordered the Owners Corporation and the Unit Owners to pay interest on those costs. By notice of appeal filed on 16 August 2019, the Owners Corporation and the Unit Owners appeal from the orders made by the primary judge. The respondents to the appeal are the Builder, the Insurer and Hughes.

Planning and Design Prior to the Shoring Works

12 Excavation of the Development Property commenced on 30 July 2010. Although ongoing design adjustments were made throughout the course of construction, several events leading up to that point are material.

The 2006 J&K Report

13 In 2006, the then owners of the Development Property retained J&K to conduct a preliminary geotechnical and hydrogeological investigation of the Development Property. On 13 March 2006, Mr Linton Speechley, then a senior associate at J&K, produced a report (**the J&K Report**), in which he recorded that the Development Property was located within topography that typically slopes down to the north or north east at gradients ranging from about five degrees to ten degrees. He said that the Development Property itself was relatively level with only a slight fall of about two degrees from the south west to the north east. The J&K Report stated that, along the rear south western

boundary of the Development Property, the Affected Property was supported by the Retaining Wall, which was described in the J&K Report as a concrete retaining wall up to 2.4 m high that appeared to be in good condition. The J&K Report said that the Building was erected 1.7 m to 2.4 m from the Retaining Wall. The J&K Report said that the subsurface conditions were of a silty sand and sand profile.

14 The J&K Report recommended additional geotechnical investigations to confirm assumptions made and to provide additional subsurface information for detailed design. It said that sufficient investigations had been carried out to confirm that the Development Property was suitable for the proposed development from a geotechnical and hydrogeological perspective. The J&K Report also stated that the Old Block, which was to be demolished as part of the proposed development, lay relatively close to the rear south western boundary of the Development Property, including the Retaining Wall, and that demolition of existing structures and paved services would need to be carried out with care so as not to damage or destabilise "nearby retaining walls or buildings".

15 The J&K Report noted that the investigation disclosed some very loose and loose near surface soils, which were likely to extend beyond the boundaries of the Development Property. It recommended that dilapidation surveys be carried out on the Building and said that those surveys could be used as a benchmark in assessing potential damage claims due to ground surface movements or vibration damage.

16 The J&K Report said that where temporary batters were not feasible, which would be the case for the majority of the excavation, a properly designed *in situ* shoring system would be required. It said that some of the options for shoring systems would be "a grout injected contiguous piled wall", "a grout injected secant pile wall" or "a Geocast wall", saying that, for all options, it would be necessary to provide temporary lateral support to the shoring system in the form of anchors or propping, on the assumption that the floor slabs of the proposed New Apartment Building would be able to provide permanent lateral support to the shoring system once construction was complete.

17 The J&K Report said that, where a contiguous piled wall is adopted, it would be essential that gaps left between the piles be continuously packed with non-shrink grout or concrete as excavation progresses. Alternatively, the face of the wall could be sprayed with shotcrete to create a more uniform finish. It said that packing was required to reduce sand loss from behind the wall and that packing should be carried out such that there is no more than 1.5 m of wall height unpacked at any one time or at any time where loss of sand from behind the wall was observed.

The Architect's Plans for the New Apartment Building

18 The Developer engaged Jahn Associates (**the Architect**) to design the New Apartment Building. By July 2009, the Architect had prepared "issued for construction" drawings for the New Apartment Building, which depicted five levels including level 0 (entry and car park), levels 1, 2 and 3, each containing two units, and level 4, containing a penthouse. The respective elevation of each level was RL6.75 m (variable) for level 0, RL9.7 m for level 1, 12.6 m for level 2, RL15.5 m for level 3, RL18.4 m for level 4. "RL" is an abbreviation for "Reduced Level", which, in surveying, refers to the elevation of a particular point, in metres, from a common datum point of 0 m. The original ground level of the site of the Old Block, prior to demolition and excavation, was approximately RL11.1 m.

19 The drawings included a provision for a lift well on the western side of the New Apartment Building facing the Affected Property, as well as two light wells on the western side of levels 1 and 2. The light wells can be seen on the plan set out above.[3] On that plan, the left-hand light well is the northernmost light well (**the Northern Light Well**), and the right-hand light well is the southernmost light well (**the Southern Light Well**). The light wells were designed to allow light and ventilation into the bedrooms to be erected on level 1 and to facilitate a parterre garden accessible from those bedrooms. The light and ventilation were required because the level 1 bedrooms on the western side at RL9.7 m would be below ground level and, without the light wells, would have no windows. The parterre gardens were to be constructed inside the light wells at

[3] At [3].

RL9.7 m, forming a bottom for the completed light wells. On 2 December 2009, the Architect produced drawings showing a lift pit below the level of the basement slab, one of which is extracted at **Appendix 1, figure A**.

Engagement of Hughes

20 During 2009, the Developer engaged Hughes as consulting structural engineers for the proposed development on the Development Property. Hughes undertook design work (**the Design Works**) in respect of the New Apartment Building as set out in structural plans prepared by Hughes. In particular, in late 2009, Hughes prepared a "shoring layout plan", which included a design for the Shoring Wall near the boundary between the Development Property and the Affected Property. The shoring layout plan is set out at **Appendix 1, figure B** and details the basement, or level 0, of the New Apartment Building. The Shoring Wall in the Hughes design was made up of a contiguous piled wall extending along the west side of the New Apartment Building as well as along parts of the north and south sides. In Hughes' original design, the Shoring Wall on the west side was not a straight line: rather, it "stepped out" around the location of the light wells. Also indicated in the 2009 Hughes plan is the location of various foundation piles that would be used to support the New Apartment Building.

Engagement of Northwood

21 In early 2010, the Developer engaged Northwood, structural engineers, to identify possible cost savings in respect of the basement layout proposed by Hughes, including the shoring layout plan. Between March and August 2010, Northwood proposed an amended shoring layout plan, which integrated the Shoring Wall into the structure of the New Apartment Building, proceeding in a straight line along the western side of the New Apartment Building as depicted in the plan set out in **Appendix 1, figure C**. Northwood investigated various ways of providing support to the proposed revised wall. However, under its final design, the Shoring Wall was to be laterally supported by steel diagonal props (**the Shoring Props**), which are also visible in the plan set out as figure C. The Shoring Props were to be connected at the base to additional piles located in the Development Property installed at an elevation lower than those in the Shoring Wall (**the Laterally Loaded Piles**) and were to extend upwards

and diagonally to connect to the capping beam, which was to be constructed along the top of the piles that made up the Shoring Wall. These props would be temporary and would remain in place until concrete slabs were poured, which would provide permanent support for the Shoring Wall. By way of illustration, the Shoring Wall and the Shoring Props (with some modifications) can be seen in the photograph taken on 6 October 2010 extracted in **Appendix 1, figure D**, although the Laterally Loaded Piles, which were connected to the base of the props, cannot be seen.

Engagement of the Builder

22 On 25 March 2010, the Developer and the first respondent, the Builder, entered into a fixed lump sum construction contract for the construction of the New Apartment Building (**the Construction Contract**). It is desirable to say something about the Construction Contract.

The Construction Contract

23 By cl 3.1 of the Construction Contract, the Builder was required to carry out and complete "the Works", a term that was defined as the construction of the "Project" pursuant to and in accordance with "the Plans". The term "Project" was defined as the demolition of existing dwellings and construction of new residential flat dwellings on the Development Property in accordance with "the Plans". The term "Plans" was not defined. By cl 3.2, the Builder warranted that the Works would be carried out in a proper and workmanlike manner and that, upon completion, the Works would be in accordance with the drawings, specifications, all authorisations and requirements of any authority that the Builder was obliged to comply with.

24 Clause 3.4 of the Construction Contract provided that the documents forming the Construction Contract included general conditions of contract AS4000-1997, as amended, the Builder's proposal dated 23 March 2010, "the Geotechnical Report" and other site reports and the drawings, specifications and other documents referred to in an annexure. The general conditions of contract AS4000-1997 relevantly provided, in cl 8.2 of that document, that the Developer would supply to the Builder the documents stated in "[i]tem 15".

Item 15 referred to a schedule of documents which does not appear to have been in evidence.

Engagement of Pile & Bucket

25 On 30 July 2010, the Builder entered into a subcontract with Pile & Bucket to carry out piling, bulk excavation and capping beam works as referred to in the documentation. The subcontract contained a detailed description of the scope of works.

Engagement of J&K and the Monitoring Plan

26 On 20 August 2009, the Developer retained J&K as geotechnical consultants for the proposed development, accepting J&K's earlier proposal of 7 August 2009. J&K's proposal drew attention to conditions of the Development Approval, including item B9 and item C16. Item C16, dealing with "hydrogeological and geotechnical monitoring programme", relevantly provided as follows:

> "Excavation works associated with the proposed development must be overseen and monitored by a qualified and practising geotechnical engineer. A hydrogeological and geotechnical monitoring programme must be produced to ensure that all geotechnical matters are regularly assessed during the construction to prevent adverse effects resulting from the excavation.
>
> The hydrogeological and geotechnical monitoring programme for the construction works must be in accordance with the [J&K Report].
>
> Prior to the issue of a construction certificate, the applicant must submit … details of the proposed hydrogeological and geotechnical monitoring programme. A suitably qualified and practising geotechnical engineer must prepare the programme which must consist of the following:
>
> - recommendations as contained within the [J&K Report];
> - recommended hold points to allow for inspection by a geotechnical engineer during the following construction procedures:
>   - excavation of the site …;
>   - installation and construction of temporary and permanent shoring/retaining walls;
>   - foundation bearing conditions and footing construction; and
>   - installation of subsoil drainage.
> - location, type and regularity of further geotechnical/hydrogeological investigations and testing."

J&K's proposal stated that J&K would prepare the required programme with reference to the J&K Report and the relevant structural and architectural

drawings, which identified and described the required testing and monitoring related to the geotechnical issues during construction, indicated the responsibilities of the various parties involved, stipulated hold points, if appropriate, and described methods and requirements for certification.

27 On 22 September 2009, Mr Speechley, on behalf J&K, provided the Developer with a "vibration hydrogeological and geotechnical monitoring plan" (**the Monitoring Plan**) intended to satisfy conditions C16 and E18 of the Development Approval. Condition E18 related to vibration during construction and provided that, prior to the issue of a construction certificate, the applicant must submit details of the proposed vibration monitoring programme to ensure that vibration created by the method of construction would not adversely impact on the existing buildings, surrounding property and infrastructure. The Monitoring Plan stated that "survey sections" [sic; scilicet "survey stations"] needed to be set up to enable survey monitoring for ground movements, with at least three stations being set up along the south western boundary and two stations along the north western boundary. Along the south western boundary, survey stations should be set up either on the Retaining Wall or other location approved by the geotechnical engineers and should consist of a survey point at the top, middle and bottom of the wall. The Monitoring Plan said as follows:

> "As a minimum, survey is to be completed at the following stages of the works:
>
> - prior to site works;
> - after demolition and prior to shoring installation;
> - on completion of shoring installation;
> - at each stage of excavation prior to installation of each row of anchors;
> - after each row of anchors are installed; and
> - on completion of shoring construction, anchoring and bulk excavation."

28 The Monitoring Plan stated that the Works were to be the subject of ongoing monitoring and review by the structural and geotechnical engineers, the purpose of which was to check initial assumptions regarding excavation, retention and groundwater conditions and possible variations that may occur, and to assess whether adjustments to design were required. The Monitoring Plan said that the potential vibrations during demolition, piling and excavation

activities could affect adjacent buildings depending on the vibration level, nature of the vibrations, distance of the source from the buildings and the characteristics of the buildings. The Monitoring Plan recommended that, to control vibration levels, an initial vibration monitoring trial be conducted at the commencement of demolition and that monitoring trials be conducted at the commencement of piling, at the commencement of bulk excavation and during initial anchor installation.

Engagement of Hughes to Conduct Dilapidation Survey

29 Hughes was retained by the Developer to carry out a pre-construction dilapidation survey (which was outside the scope of their original retainer). It appears that a report was prepared, although only a single page of the report was in evidence. That page indicated that the report's purpose was to record accurately and document the condition of the Building, that part of the dilapidation inspection was carried out on 7 October 2009 and that Hughes had been commissioned by the Developer to carry out the report. The dilapidation survey was relevant when complaint was first made about damage to the Building.

Northwood's Shoring Wall Proposal

30 On 26 February 2010, Northwood wrote to the Developer proposing services concerning an assessment of the existing structural design and documentation for possible cost savings. Northwood proposed that it would peruse identified drawings, identify possible savings that may be won by amendment of the existing basement layout and retaining walls, carry out structural calculations to provide the size of amended structural elements for costing and provide sketches of the changes laid over existing drawings. The letter said that detailed reinforcement and connection details were not provided at that stage but would be required for construction.

Butter Paper Sketches

31 On 7 March 2010, Northwood provided a "butter paper sketch" laid over the existing Hughes plan for the basement level labelled "SK1" and "Part Plan - Revised Contiguous Pier Layout", which was endorsed "for costing only". An accompanying sketch, "SK2", was issued on 9 March 2010 showing a cross-

section of the basement level and level 1. Both sketches provided for a straight Shoring Wall along the western boundary of the Development Property, such that the piling wall would not step around the light wells and would be integrated within the structure of the New Apartment Building. The plans are set out in **Appendix 1, figures E and F**.

32 In those plans, temporary support to the Shoring Wall was to be provided by a 6 m to 12 m wide sand embankment, or "berm",[4] placed in front of the Shoring Wall (i.e. on the Manning Road side). The berm appears to slope down from the Retaining Wall at approximately RL12.8 m, past the Shoring Wall to a base at RL6.75 m on a 1:2 ratio slope. Permanent support would be provided to the Shoring Wall by the level 1 concrete slab. Once that was constructed, the sand embankment could be removed.

Further Correspondence

33 On 16 March 2010, Northwood wrote to the Developer saying that the structural calculation and the identification of possible savings to the basement retaining walls and layout had been completed on 9 March 2010. The letter said that, during the course of that work, the existing geotechnical investigation was found to be insufficient and that Northwood had engaged a geotechnical engineer in order to progress savings "in the extremely limited timeframe granted" for the work. Northwood noted that Hughes remained "responsible" for all footings, columns, pits, structure outside the main wall lines forming terraces, pathways and general landscaping, and that columns, footings and ground floor structure affected by the cost savings work were to be amended by Hughes.

34 On 24 March 2010, Northwood wrote to the Developer again, repeating that, during the course of work that it had carried out, the existing technical investigation was found to be insufficient. Northwood proposed that a meeting be convened in order to agree on any options that may be required in relation to the drawings that had been prepared and said that, once those issues had been resolved, the construction drawings would be produced. Northwood proposed a fee to discuss and resolve all outstanding issues and produce the

[4] "Berm" is a term that appears at times to have been used interchangeably with "batter". To the extent that they are distinct, it appears to that a berm performs the function of a batter.

electronic construction drawings that, the letter said, were required by 16 April 2010. The letter again noted that Hughes remained "responsible" for all footings, columns, pits, structure outside the main wall, lines forming terraces, pathways and general landscaping and that columns, footings and ground floor structure affected by the cost savings work were to be amended by Hughes.

19 May 2010 Meeting Between Developer, Builder and Architect

35 A meeting was held on 19 May 2010 at which representatives of the Developer, the Builder and the Architect were present. At that time, demolition of the Old Block had recently commenced. Minutes of the meeting recorded that the Builder had a Stage 1 construction certificate covering demolition, bulk excavation, shoring, piling and associated structural works. The minutes also recorded that the Builder was to contact Mr Neil Walsh, the principal of Northwood, for confirmation of piling design, piling tender assessments and associated ground works. The Builder was to organise bore holes with J&K or an excavation subcontractor and was to liaise with Mr Walsh and J&K for the number and location of boreholes. The minutes recorded that the Builder had yet to settle on the construction method and that the Builder was to consult with Mr Walsh for the best construction method option and was to confirm the construction method and reasons for the choice.

Architect Integrates Northwood's Shoring Wall Design

36 On 9 June 2010, the Architect prepared a construction plan for level 1, which incorporated Northwood's proposed straight Shoring Wall. Significantly, that plan indicates that the revised Shoring Wall would not be high enough to run through the light wells at the elevation of level 1 (RL9.7 m). The plan is set out at **Appendix 1, figure G.**

Determining Shoring Wall Design and Temporary Support System

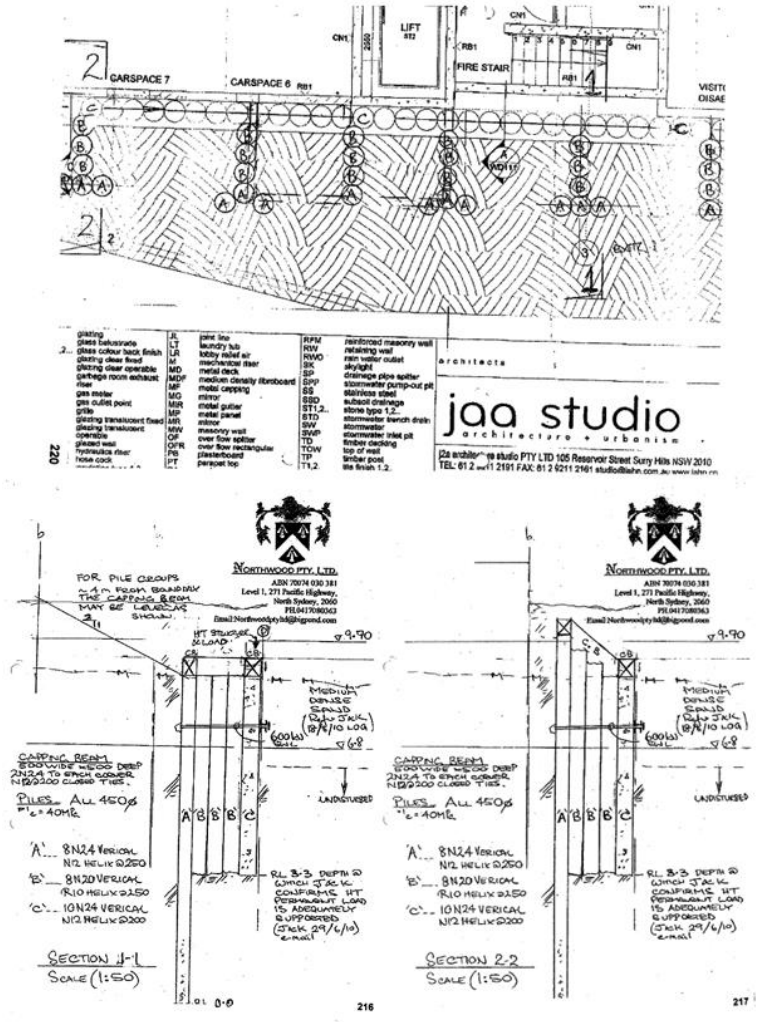
37 The design of the Shoring Wall was the subject of extensive correspondence and discussion between the Builder, Northwood and J&K from July 2010 onwards. Northwood appears to have investigated several potential designs, including different means of providing temporary support to the Shoring Wall until such a time as the concrete slabs were complete.

"Reverse Buttressing" Temporary Support System

38 At some stage prior to 7 July 2010, the Architect requested Northwood to consider an alternative form of temporary support for the Shoring Wall involving "reverse buttresses", as opposed to the sand berm in the original designs.[5] On that day, Northwood provided to the Architect several sketches and plans "for issue to" Pile & Bucket for costing, noting that Mr Speechley of J&K was to confirm the geotechnical adequacy. Mr Walsh described this as "a second alternative pile wall with reverse buttresses".

39 The "reverse buttressing" system detailed in the plans detail a system of support for the Shoring Wall, whereby the Shoring Wall would be supported by lines of piles in a "T" shape drilled perpendicular to the Wall in the space between the Shoring Wall and the Retaining Wall. Such pile lines would be connected to the Shoring Wall by a capping beam in order to provide bracing for the Shoring Wall. The buttressing system is indicated in the following three plans, including the different types of piles "A", "B" and "C", C denoting the piles that formed part of the Shoring Wall:

[5] See above at [32].



The first plan (top) is a top down-plan of the Shoring Wall made up of C piles with the pile buttresses running perpendicular. The second plan (bottom left, marked "1" in the top plan) is a cross-section of the buttresses that were located at least 4 m from the Retaining Wall and boundary. In those cases, there would be a berm between the Retaining Wall and the edge of the capping beam of the buttress. The third plan (bottom right, marked "2" in the top plan) is a buttress that is much closer to the Retaining Wall and the piles are progressively higher than the level of the Shoring Wall. Other parts of the plans (not extracted) showed the Shoring Wall in its entirety, made up of Type C piles, along with further reverse buttresses.

40 On 8 July 2010, Mr Daniel Lipari, a contract administrator for the Builder, sent the plans to Pile & Bucket for quotation. On the same day, the Architect sent a copy of the reverse buttress plans to J&K. The Architect requested J&K to review the design "in regard to the geotechnical capabilities of the site and

confirm your sign off in writing" and said that the piling was programmed to start shortly.

41 On 9 July 2010, J&K sent an email to the Architect acknowledging receipt of "the pile design" and saying that Northwood would need to provide design calculations showing what had been adopted for the design and calculations to confirm the overall wall stability. J&K said that, once it had been received, the pile design could be reviewed and comments provided. J&K expressed some concern about the Retaining Wall's stability, noting that, while a sand berm with a 1V:2H ratio[6] would be stable on its own, it might not be stable if the crest (around the top) was "surcharged" by a footing of the Retaining Wall. The email also suggested that the batter slope may also be removing some passive support to the Retaining Wall. J&K said, however, that, ultimately, it would be Northwood's responsibility "to 'sign off' the wall as it is his design". A copy of that email was also sent to the Builder and Northwood.

42 On the same day, Northwood sent a letter to the Architect and forwarded sketches providing "surcharge load" for J&K's model. The letter said that the drawings were provided for costing purposes only and were conditional on additional geotechnical information. The letter also said that J&K was to provide contiguous pier sizes and depths and were to provide "imposed moments and shears" on the contiguous wall as well as maximum deflection of the wall.

J&K Required to Conduct Geotechnical Design of Shoring Wall

43 On 12 July 2010, Mr Speechley, on behalf of J&K, sent to the Builder, the Architect and Northwood an email saying that it had become apparent that Northwood required J&K to carry out the geotechnical design of the Shoring Wall. Mr Speechley reiterated some concerns about the stability of the nearby Retaining Wall that he had expressed in an earlier email on 9 July 2010, particularly where the batter slope was proposed. He said that, at that stage, he would not be in favour of such a batter system unless the Retaining Wall could be confirmed to have adequate stability with such a batter slope and that,

[6] A ratio of 1 vertical unit to 2 horizontal units.

where the wall stability could not be confirmed, the top of the piles would need to be no lower than existing ground surface levels.

44 J&K also attached a proposal addressed to the Builder concerning "geotechnical inspections, advice and designs during construction", saying that J&K proposed to carry out all geotechnical consulting services on the basis of the rates set out. Mr Speechley also proposed a site meeting to discuss the wall issues.

21 July 2010 Site Meeting Between the Developer, Builder and Architect

45 A site meeting took place on 21 July 2010 attended by representatives of the Developer, the Builder and the Architect. The minutes of the meeting record that the Developer required that drilling start on 28 July 2010 and that the Builder was to commence piling as soon as possible. The minutes also record that Northwood was to design the piles, and not J&K, and that Northwood had since requested J&K to model the piles and was awaiting results.

46 On 23 July 2010, the Builder responded to Mr Speechley's email of 12 July 2010 requesting him to "carry out geotechnical modelling of Neil Walsh's piling design (using WALLAP) to ensure that J&K can certify geotechnical properties that [Northwood] has relied upon in his design ([Northwood] will certify all structural elements of his design)". The Builder also noted that, following Mr Speechley's concerns with the proposed batter to retain the Retaining Wall, the Builder agreed with his suggestion that Mr Speechley complete modelling with the capping beam at a higher level.

J&K Concludes Reverse Buttress Design Infeasible

47 On 29 July 2010, Mr Speechley, on behalf of J&K, sent an email to the Builder, saying that a first run of "the Wallap retaining wall analyses" had been carried out to assess Northwood's proposed shoring system along the south western boundary of the Development Property. Mr Speechley said that it had become clear that the proposed batter slope from the rear of the Shoring Wall back up to the existing Retaining Wall was not feasible until about half way along the Retaining Wall. He confirmed that he was not in favour of "the [1V:2H] batter slope" since there was an unacceptable risk of inducing instability of the adjoining Retaining Wall and possibly the Building beyond if it was founded on

shallow footings. Thus, Mr Speechley's model proceeded on the basis that there was no batter in place. His model also assumed that the height of the Shoring Wall was not lower than RL11.1 m, the original ground level of the Old Block.

48 Mr Speechley said that the analysis indicated that the Shoring Wall would be unstable without any propping and that, in order to model the "propping" effect of the proposed buttresses,[7] a dummy prop was installed at the top of the Shoring Wall. The modelling showed that the dummy prop needed to be able to bear a specified working horizontal load, which indicated the load that the proposed buttressing would need to be able to resist. Mr Speechley also said that the wall analysis assumed that bulk excavation did not extend deeper than RL6.6 m, or about 0.2 m below the "RL6.8 m [finished floor level]", which was the floor level of level 0. He said that, if any greater depth of excavation occurred, higher loads and bending moments would be expected.

49 Based on the WALLAP analysis and other calculations conducted to assess the feasibility of the buttress propping system, the type "A" piles[8] would need to be extremely long, namely, 20 m, in order to resist the required loads. Thus, J&K did not consider that they were a feasible option to support the Shoring Wall.

50 In light of that conclusion, J&K recommended that further consideration be given to either providing lateral support to the Shoring Wall by the use of anchors or, if anchors were not possible, constructing the Shoring Wall using "top down construction". Top down construction would have involved the Shoring Wall being laterally supported by the ground floor slab (i.e. level 1) at RL9.7 m before further excavation below the ground floor slab level was conducted.

Investigation of a Lateral Propping System to Support the Shoring Wall

51 On the evening of 29 July 2010, after being sent J&K's findings concerning the reverse buttress system, Northwood emailed the Builder, J&K and the Architect, noting the problems identified by Mr Speechley and his proposal for

[7] See above at [38]–[39].
[8] See diagrams above at [39].

"top down construction with temporary props to the capping beam". In a further email that evening, Northwood asked J&K if the Builder could provide conventional wall props and, once they were in position, excavate to the basement level. Those and other communications culminated in an email on 2 August 2010 from Mr Speechley to the Builder and Northwood, in which Mr Speechley set out the assumed construction sequence of the Shoring Wall (for one section of the wall), including use of the Shoring Props, which was as follows:

1. Install [Shoring Wall] to a toe level of RL3.3 m;
2. Install [Shoring Prop] at RL11.1 m;
3. Excavate to RL6.6 m;
4. Install basement [at] RL6.7 m and ground floor slab [at] RL9.8 m;
5. Remove [Shoring Prop].

Mr Speechley then summarised the WALLAP analysis that he had conducted, which indicated the loads that the Shoring Props would have to bear. He noted that the analysis assumed that "bulk excavation" would not exceed a depth of RL6.6 m for the basement floor slab. It appears that, at that stage, what the Shoring Props would be attached to at their base had not been finally determined.

The Course of the Works on the Development Property

30 July 2010 Excavations by Pile & Bucket

52 On 30 July 2010, Pile & Bucket carried out exploratory excavation in front of parts of the Retaining Wall to expose its footings. Prior to commencing excavation, Mr Paterson of Pile & Bucket observed that a berm existed against the Retaining Wall with a height "generally above RL11 m" and that that appeared to be the only support for the Retaining Wall. On 2 August 2010, Pile & Bucket carried out "benching" excavation to form a sand berm against the Retaining Wall in preparation for piling of the Shoring Wall. "Benching" is a method of preventing cave-ins by excavating the sides of an excavation to form horizontal levels or steps with near vertical surfaces between levels. Forming the berm would have involved "battering", which involves creating a slope on the sides of the excavation at a particular angle.

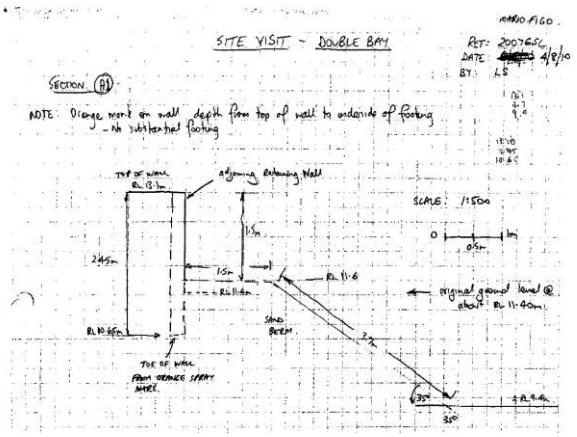
53 The effect of the excavation was to:

(1) excavate the relevant area of the Development Property down to RL9.4 m (approximately level 1 of planned New Apartment Building);

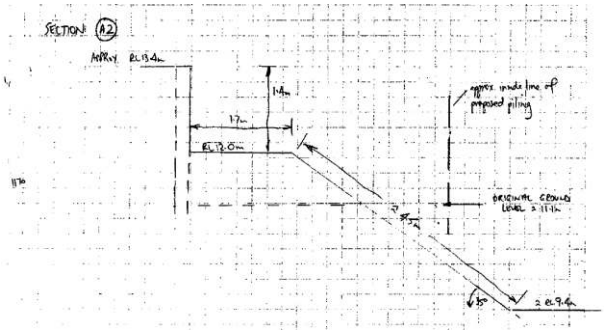
(2) create a sand berm at an angle of around 35 degrees, the "toe" of the berm began at RL9.4 m sloping upwards at an angle of 35 degrees to reach a height of between RL11.5 m and RL12 m; and

(3) create a horizontal crest at the top of the berm, which was a flat section that extended from the top of the berm's slope to the Retaining Wall, the crest being between 1 m and 1.7 m wide adjacent to the Retaining Wall.

54 A cross-sectional drawing made by Mr Speechley on 4 August 2010 illustrates the effect of the proposed excavation as set out below:



The 35 degree toe of the berm is visible in the bottom right (at the excavated depth of RL9.4 m), the berm then slopes up for 3.7 m to RL11.6 m, before flattening to form a crest that then extends for 1.5 m to the Retaining Wall, which is on the left hand side of the drawing (the top of the Retaining Wall being RL13.1 m and the "toe" of the Retaining Wall being RL10.65 m). At certain points (generally where the Shoring Wall and Retaining Wall were closer together) the Shoring Wall would run through the slope of the berm, as indicated in a further sketch from 4 August 2010, which indicates the "approximate inside line of proposed piling" (as at that particular section). The sketch is as follows:



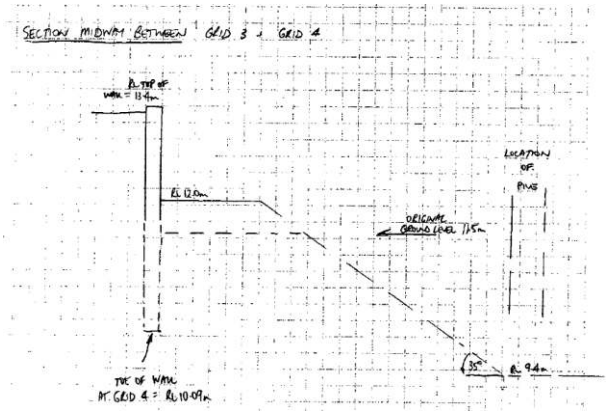
4 August 2010 J&K Site Visit and Report

55 On 4 August 2010, Mr Speechley visited the site to provide advice regarding shoring along the western side of the Development Property. In an email of that date, Mr Speechley said that one of the critical issues for the Shoring Wall would be to maintain the stability of the Retaining Wall and the Building, which were to the west. The email said that the site currently had a soil berm placed against the Retaining Wall and western boundary (as shown in the diagrams above). He noted that, typically, the top of the berm was about RL12.0 m, although at the southern end it was only about RL11.5. The berm had a crest width ranging from about 1 m to 1.5 m wide and then sloped down at a gradient of about 35 degrees to approximately RL9.0 m (as shown in the sketches set out above).

56 Mr Speechley confirmed that, as discussed on site, it was not possible, over a large portion of the Shoring Wall, for it to be constructed with a capping beam "at RL9.2 m". He said that the amount of excavation required to achieve those levels would potentially lead to instability of the Retaining Wall and that, therefore, the capping beam would need to be raised, so that the stability of the Retaining Wall would be maintained. It appears that the reason was that the footing of the Retaining Wall was between RL10.68 m and RL10.09 m, which was only (approximately) 0.8 m and 1 m respectively below the original ground level of the Development Property prior to demolition of the Old Block (RL11.1 m). Thus, a Shoring Wall with a capping beam at RL9.2 m would have a height that was below the footings of the Retaining Wall that it needed to support.

57 The email said that it had been agreed on site that the top of the capping beam must be raised to not lower than RL11.1 m for the section of the Shoring Wall

from the extreme northern end (encompassing the Northern Light Well) and including the Northern Return Wall. To the south of those sections of the Shoring Wall, the top of the capping beam could be dropped down to the original RL9.2 m. In those parts of the Shoring Wall, as shown in the following sketch, the piles for the Shoring Wall did not appear to interfere with the berm as, in those sections, the distance between the Shoring Wall and the Retaining Wall was greater:[9]



58 Mr Speechley also said in his email of 4 August 2010 that, over the section of the berm where the capping beam was to be placed at "RL11.1 m", it would be necessary to increase the size of the berm to accommodate the piling equipment. He recommended that, during reformation of the berm, the top of the berm not be taken deeper than RL11.5 m, which was equivalent to the original ground level plus some allowance for the loosening of the upper sands. Mr Speechley also said that the berm must have a crest of not less than 3 m, although it was expected that that would be much wider to accommodate the piling rig safely. The email said that the berm must also have a batter slope not steeper than 1V:2H. Mr Speechley recommended that, over the section of berm where the capping beam was to be placed at RL9.2m, the berm be maintained as per its current configuration.

59 Finally, Mr Speechley said, once the piling for the Shoring Wall was completed and the capping beam formed, a berm must be maintained in front of the Shoring Wall until the propping of the Shoring Wall was in place. He said that the berm should have a crest width of not less than 1 m with the crest at not

[9] See above at [3].

lower than RL10.5 m and that the berm must be battered at not steeper than 1V:2H.

Instructions to Backfill Excavation for Re-benching and Re-battering

60 On 4 August 2010, after Mr Speechley's site visit, the Builder instructed Pile & Bucket to backfill a large amount of what they had already taken out. The Builder said that there was going to be significant changes to the piling and that the Builder would have to go back to the engineers and modify the design. As a result of instructions from Mr Speechley, which were confirmed by Mr Frigo on behalf of the Builder, Pile & Bucket was directed to refill the excavation by re-benching and re-battering. The purpose of doing so was to increase the size of the berm to meet Mr Speechley's requirements. Pile & Bucket was instructed that the capping beam would now be at RL11.1 m.

Piling for Shoring Wall Commences

61 On 6 August 2010, Pile & Bucket commenced piling for the Shoring Wall. Shortly beforehand, Mr Frigo of the Builder had told Pile & Bucket that the retention system, being the design and specifications of the Shoring Props, had not been finalised and that the final drawings would be provided when Northwood had finalised the design.

Issues Arising out of the Straight Shoring Wall Design

62 On 9 August 2010, the Architect sent an email to J&K, the Builder and Northwood, noting that there seemed to "have been some confusion at the site meeting" and saying that the piles for the Shoring Wall needed to avoid the external parterre gardens at RL9.7 m and that the piles could not be run through the gardens, which bring light into the bedrooms. That was in reference to the piles in the area of the Northern Light Well, which would now have a capping beam height of RL11.1 m. In effect, running a piling wall of that height through that section would largely block the windows or openings to the level 1 bedrooms that were intended to look out into the Northern Light Well and parterre garden. The Architect said that to reduce the light and ventilation to those spaces would go against "[Building Code of Australia] requirements".

63 Mr Speechley brought this to Northwood's attention in an email dated 11 August 2010 (other aspects of which are addressed below) and observed

that it appeared that the pile wall would need to step around the parterre gardens, which would take the Shoring Wall closer to the boundary. Mr Walsh responded on the same date saying that the piles for the Shoring Wall "do not step around the parterre garden". He said that it was so important to get the main building going that he agreed with the Builder that they would put the piles through in a straight line and sort the parterre out when they were "able to strut back off the [New Apartment Building]".

Design of Shoring Props and Prop Foundations

Northwood's Concrete "Pad" Foundation Proposal

64 During his site visit on 4 August 2010, Mr Speechley made some sketches titled "calculate passive restraint from propping footings", which detailed a proposal by Mr Walsh made during a discussion in the course of the site visit regarding attachment of the base of the Shoring Props. These sketches and calculations described installing 1.5 m square x 1.5 m deep concrete "pads" spaced at 3.5 m intervals. The props for the Shoring Wall would then be attached to the pads. Mr Speechley's notes following certain calculations noted that the proposals were "unacceptable" with respect to the total resistance to sliding and the factor of safety (**FOS**) against overturning. On the same day, Mr Speechley communicated his conclusions to Mr Walsh and, in a handwritten letter dated 4 August 2010, Mr Walsh provided a revised pad design and calculations using 2 m square x 2 m deep concrete pads.

65 Mr Speechley responded by email on 9 August 2010, concluding that, while the sliding appeared adequate, each pad would have an unacceptable FOS against overturning. He also noted that it would be virtually impossible to excavate such pads due to significant portions of the berm needing to be removed in order to do so. Thus, Mr Speechley strongly recommended that the pad footing option not be attempted and recommended either to anchor the new Shoring Wall or to assess strutting to a pile or pile group.

Adoption of Laterally Loaded Pile Foundation

66 Mr Walsh responded later on the same day, noting that a piled option may well be cheaper than excavating large pads and requesting the acceptable lateral capacity for such a pile. That would have involved connecting each Shoring

Prop to the capping beam of the Shoring Wall and then to a capping beam linking additional piles groups located in front of the Shoring Wall. He also noted that, as Hughes was designing the foundation piles for the New Apartment Building, it might be possible to strut off the lift piles and internal column piles to save some money. After checking with the Builder, Mr Walsh, in a further email to Mr Speechley, noted that the largest pile diameter for the piling rig on site was 600 mm.

67 On 11 August 2010, Mr Speechley sent an email to Mr Walsh saying that he had carried out some lateral pile calculations and summarised those results. The results related to a 6 m long, 600 mm diameter pile and, among other things, the allowable lateral load for such a pile that would be exerted by Shoring Props.

68 He also addressed Northwood's proposal to strut with the Shoring Props at the RL11.1 m level of the Shoring Wall, excavate and then install additional Shoring Props at RL9.2 m, followed by removal of the upper RL11.1 m strut. Mr Speechley summarised the results and said that the model assumed a batter slope of not steeper than 1V:2H on the passive side, being the Manning Road side, of the Shoring Wall during installation of the Shoring Props. He said that the berm must not be removed until at least the upper strut was installed.

Finalisation of Pile Layout and Specification

69 On 12 August 2010, the Architect provided to the Builder, Hughes and Northwood a copy of Northwood's sketch "for the design intent to the northern boundary". The Builder was asked to discuss that with Hughes, so that Hughes could complete its drawings and issue them for construction. At this stage, Hughes was responsible for other elements of the basement, such as the design and specification of foundation piles, which would provide support for structural columns. Thus, what follows is some overlapping discussion of piling for the Shoring Wall and for other aspects of the structural design unrelated to the Shoring Works. Mr Walsh was asked to forward an electronic copy of the drawings for the column solution to the car park that was to be located in the basement.

70 On 16 August 2010, the Builder emailed Mr Speechley asking whether 450 mm diameter piles at the base of “bracing” to the perimeter piles (i.e. to the Shoring Wall) could be used. The “bracing” appears to be a reference to the Shoring Props. The question was asked because doing so would enable the use of the piling rig currently on site rather than having to bring in a new piling rig, presumably because the rig on site was unable to accommodate 600 mm piles despite what Mr Walsh had reported earlier (see [66]). Mr Speechley responded that 450 mm diameter piles would not carry as much horizontal load as the 600 mm diameter piles. He said that 450 mm diameter piles were unlikely to be feasible unless another almost contiguous 450 mm diameter piled wall was constructed to strut against.

71 On 18 August 2010, J&K sent an email to Hughes and the Builder referring to a drawing sent by Hughes that showed the proposed pile layout and loads. J&K summarised additional calculations for individual single piles of 400 mm, 600 mm and 750 mm in diameter located at various depths below excavation. J&K said that the nominated 400 mm diameter piles would not be big enough to carry the loads unless larger pile groups were adopted. The email ended by saying that, depending on the spacing of the piles in a pile group, the total pile group capacity is usually less than the sum of the individual piles. A short time later on the same day, J&K sent an email to the Builder and Northwood referring to their discussions of the previous day, suggesting that the spacing of the 600 mm piles proposed by the Builder and Northwood was not correct**.**

72 Later still on 18 August 2010, Dr Andy Wang of Hughes sent an email to the Builder and J&K saying that he had carried out calculations for piles to support columns and asking, as 400 mm piles were not big enough, which size of 600 mm piles or 750mm piles was preferred so that the design of the piles could start. Still later on 18 August 2018, Mr Walsh sent an email to the Builder, J&K and the Architect saying that, if the piles were changed to 450 mm diameter pairs, then the 600 mm diameter piles currently shown on a drawing identified could be substituted with a pair of 450 mm piles joined with a capping beam for each 600 mm pile. Mr Walsh said that they would require a slightly wider capping beam.

73 Still later on 18 August 2010, Mr Walsh sent an email to Dr Wang of Hughes, with a copy to the Architect and the Builder, saying that he had detailed the northern boundary, which was outside his scope of work, just to point out "what is, was and will be there" for the Hughes and Architect designs, as well as to confirm a reasonable end to the northern piles, which was his scope, as the extent was different between the Hughes and Architect drawings. Mr Walsh also said that the contiguous wall was confirmed by J&K as being able to support the wall loads that Hughes provided. He said that, if significantly higher bearing capacities for piles were now being provided, it was a serious matter that should be taken into account in the Hughes design. Mr Walsh said, "we share your concern" and said that the extent of any effect should be confirmed by J&K and any construction implications raised with the Builder.

Pile & Bucket Instructed to Construct Piles for the Light Wells

74 Again on 18 August 2010, the Builder instructed Pile & Bucket on site to construct five piles in each of the areas identified for the light wells with a capping beam at the top at RL11.1 m for the Northern Light Well and at RL9.2 m for the Southern Light Well. Mr Paterson of Pile & Bucket noted that, at the time of receiving those instructions, he made handwritten notes on a plan in relation to instructions received on site. He noted there were also notes on the plan made by a person he believed to be an employee of the Builder. The marked-up plan is set out at **Appendix 1, figure H.**

Northwood Issues Final Plans for Shoring Wall and Shoring Props

75 Construction of the Laterally Loaded Piles for the Shoring Wall was completed by 19 August 2010. Thereafter, it was necessary for the Shoring Props to be obtained. On that day, Northwood produced drawings endorsed "reissued for construction". The prior version marked "issued for construction" was dated 17 August 2020 and had been circulated by Northwood for comment on that day. Those drawings for "level 0 – entry and car park" depicted the Shoring Wall along with the 12 Shoring Props that Northwood had designed to support the Shoring Wall.[10]

[10] See Appendix 1, figure C.

Provision for Lateral Piling Design

76 The Northwood plans provided for the Shoring Props to be attached to a capping beam placed on top of the Laterally Loaded Piles. The plans provided for the piles to be 600 mm in diameter. Some of the Shoring Props were to be attached to two 600 mm piles, whereas others were to be attached to a single 600 mm pile. However, it appears that due to the limitations on the piling rig available on site, each 600 mm pile was replaced with two 450 mm piles arranged in a row parallel to the Shoring Wall. Thus, some of the Shoring Props were actually supported by a line of four (as opposed to two) Laterally Loaded Piles linked by a capping beam running parallel to the Shoring Wall, and others were connected by a group of two piles with a capping beam, as opposed to a single pile.

Provision for Cutting Down Piles in the Northern Light Well

77 The Northwood drawing showing a cross-section of the "West Elevation" provided for the cutting down of the piles adjacent to the Northern Light Well to facilitate light ingress and the installation of a "waler beam" lower on the excavated piles. A waler beam is a timber or concrete beam used to support or maintain required separation between components to help maintain the form of a construction under stress. Northwood's drawing is set out at **Appendix 1, figure I.** As the drawing suggests, there was no need for the capping beam and the piles of the Shoring Wall adjacent to the Southern Light Well to be cut down, as the height of the Shoring Wall in that section was lower than the section near the Northern Light Well.

20–23 August 2010 Excavation and Construction of Light Well Piling

78 Between 20 and 23 August 2010, Pile & Bucket carried out the construction of the ten piles required for the light wells in the area between the Shoring Wall and the Retaining Wall. Thus, on 20 August 2010, the site was "benched", which involved excavating material so as to provide a level area for the drilling of the piles. On the following day, construction of the piles began with seven of the ten light well piles being built, with the remaining three having to be constructed on 23 August 2010 due to grout delay. Further excavation was conducted around the top of the piles to facilitate installation of the formwork necessary for the construction of the capping beams. The capping beam

around the light wells was poured at some point after 23 August 2010, when the formwork was constructed, and before 7 September 2010, when Mr Speechley photographed it.

79 Those excavations for the benching and formwork were from the earth berm that supported the Retaining Wall. Significantly, the Northern Light Well was especially close to the Retaining Wall. Thus, excavating the berm to facilitate the light well piling and capping beam in that area was performed very close to the Retaining Wall.

20 August 2010 J&K Site Visit

80 On 20 August 2010, Mr Woody Theunissen, a representative of J&K, visited the Development Property. He subsequently said in an email that he had noted that, in places, the batters formed up against the Retaining Wall had been removed. He recommended that all batters be reinstated "without delay", in accordance with the recommendations provided in Mr Speechley's email report of 4 August 2010.

8 September 2010 J&K Site Visit

81 Monitoring survey results for 8 September 2010 (labelled "visit 2") recorded movement of the Retaining Wall towards the Development Property since 5 August 2010 (labelled "visit 1"). Of the ten stations, one station recorded a movement of 7 mm, while the remaining nine stations recorded no change.

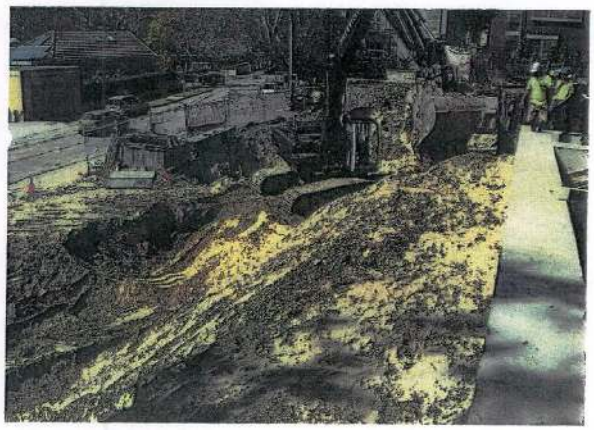
82 On 8 September 2010, Mr Speechley carried out a site visit to inspect the progress of the Shoring Works and sent an email to the Builder recording observations that he had made as follows:

- the Shoring Wall had been completed and the capping beam poured;
- the two square parterre gardens had been formed by constructing piers below each corner and centrally along the western side, a capping beam connecting the piers. Mr Speechley understood that the capping beam on the northern most parterre garden [Northern Light Well] had been poured up against the existing western boundary wall and that the timber bracing was put in for precautionary means only;
- survey monitoring of the existing boundary retaining wall [the Retaining Wall] along the western boundary was being carried out. Mr Speechley requested a copy of the survey results as soon as they were available;

- an irregular sand berm existed against the Retaining Wall between the Retaining Wall and a new contiguous piled wall [the Shoring Wall], the berm having a gradient at about 45 degrees with no crest width and the top of the berm ranging from 0.5 m to 1 m below the top of the Retaining Wall;
- a berm existed on the passive (excavated) side of the new Shoring Wall currently having a crest width ranging from about 1.5 m to 2 m and sloping down at a gradient ranging from 35 degrees to 40 degrees, the top of the berm being about 0.5 m below the top of the capping beam: this is a different berm supporting the Shoring Wall, as opposed to the irregular sand berm mentioned above, which was supporting the Retaining Wall;
- bulk excavation had been taken down to about RL5.9 m so that piers could be drilled (for the Laterally Loaded Piles) to support struts to the new contiguous piled wall [the Shoring Wall]: Mr Speechley noted that the RL5.9 m level was the bottom of the capping beam over the [Laterally Loaded Piles] and that RL6.6m was the original bulk excavation level.

The irregular sand berm against the Retaining Wall, and the Temporary Retaining Propping (see below at [84]) above the Northern Light Well, is depicted in a photo taken by Mr Speechley during his site visit on 8 September 2010. The photo, which looks to the south, is set out below:

A part of the berm against the Shoring Wall is depicted in the photo of the same date set out below, where the capping beam at RL11.1 m is visible in the right-hand side, with Manning Road on the left:



83 In his email of 8 September 2010, Mr Speechley made comments and recommendations as follows:

- The current berm supporting the Shoring Wall was not in accordance with the recommendations set out in J&K's email of 4 August 2010. The berm must be modified to have a batter slope not steeper than 1V:2H (that is to say about 26 to 27 degrees). The toe of the current berm was also lower than was assumed in J&K's wall analysis and had to be raised as soon as possible to RL6.6 m. For the very short-term temporary case, the level of RL5.9 m could be maintained until the Lateral Loading Piles supporting the new struts were constructed. However, the level must be raised back to not lower than RL6.6 m immediately after those piles being constructed. That was on the assumption that the berm was kept at not steeper than 1V:2H as discussed above.
- The monitoring results for the existing Retaining Wall should be provided for review as soon as they were available and the wall should be visually inspected at least daily for any signs of distress, including the footpath area above the Retaining Wall on the Affected Property.
- After the Shoring Wall has been strutted, bulk excavation must not extend deeper than RL6.6 m.

The Temporary Retaining Propping

84 At some point, the Builder installed temporary timber props near the Northern Light Well and connected to the Retaining Wall in order to provide support for the Retaining Wall during the course of construction (**the Temporary Retaining Propping**). It is important to distinguish the Temporary Retaining Propping from the Shoring Props. The Temporary Retaining Propping as observed by Mr Speechley on 8 September 2010 is shown above.[11] Although the evidence does not reveal exactly when the Temporary Retaining Propping was installed, Mr Frigo of the Builder agreed that he had it installed as a result

[11] See above at [82] (the first of the two images).

of an instruction from his “superiors”. Mr Frigo could not remember if there was any geotechnical or structural advice about the installation. On 25 August 2010, Mr Walsh sent to the Developer a tax invoice that recorded “site inspection and advice” on 24 August 2010 in relation to, amongst other things, the “temporary propping of the [Retaining Wall]”. Mr Walsh did not indicate in his evidence and was not asked in cross-examination, what “advice” he had given to the Builder about “temporary propping” of the Retaining Wall. Thus, it is unclear whether the Temporary Retaining Propping was already installed on 24 August 2010, or was still yet to be installed at that time. In any case, they were in place no later than 8 September 2010.

10 September 2010 Hughes' Concerns Regarding the Foundation Piles

85 On 10 September 2010, Hughes sent an email to Mr Speechley, the Builder and the Architect, saying that they had a concern that there would be differential settlement between the contiguous piles forming the Shoring Wall and the foundation piles supporting internal columns. Hughes said that the distance between the Shoring Wall and the internal columns was only 4 m and the maximum differential settlement that would be considered acceptable was 8 mm.

Cutting of the Northern Light Well Shoring Wall Piles and Capping Beam

86 On 20 September Pile & Bucket carried out jackhammering to cut the capping beam off the part of the Shoring Wall that passed through the Northern Light Well and reduce the pile heights on those piles in accordance with Northwood's design (**Appendix 1, figure I**). On 30 September 2010, the waler beam was connected between the piles.

11–27 September 2010 Construction of the Shoring Props

87 On 11 September 2010, Pile & Bucket recorded that they had begun piling on the “strut piles” (the Laterally Loaded Piles) and noted, on 15 September 2010, that the last of the pile caps had been poured and that the steel beams for the Shoring Props had arrived on site. Work on fabricating the Shoring Props began on 20 September 2010.

88 On Monday, 27 September 2010, Mr Paterson of Pile & Bucket sent an email to the Builder saying that a programme for completion would be provided that

day. He said that he had held off doing that on the previous Monday, 20 September 2010, on the basis that Northwood was to be requested to review the extension of the strut arrangement. Pile & Bucket had to procure materials when it was known what was required in terms of the strut extension (for the Shoring Props). Mr Paterson said that Pile & Bucket expected to have all Shoring Props taking load by the following day, 28 September 2010, but that the changes to the requirements of the work were causing delay and Pile & Bucket was responding as quickly as the supply of additional materials and resources allowed.

22 September 2010 Northwood Site Inspection

89 On 22 September 2010, Mr Walsh of Northwood conducted a site inspection to resolve issues about Shoring Props of incorrect length. He designed a rectification on site and agreed upon the rectification with the Builder and Pile & Bucket.

6 October 2010 J&K Site Visit and 7 October 2010 Report

90 Monitoring survey results for 7 October 2010 recorded no movement of the Retaining Wall from the previous results on 8 September 2010. On that day, J&K sent a report to the Builder (**the 7 October Report**), confirming that Mr Speechley had visited the site on 6 October 2010 to inspect and provide geotechnical advice for the support of the two parterre garden areas (i.e. the light wells) as well as a general geotechnical review of site progress.

J&K Observations About the Light Wells and the Retaining Wall

91 Mr Speechley said in the 7 October Report that he observed that the capping beam for the contiguous piled Shoring Wall had been extended out and around two parterre garden areas (i.e. around the light wells) and was supported by the five piles around each of the parterre gardens. Mr Speechley said that the height of the top of the capping beam for the Northern Light Well was RL11.1 m and the final floor level (**FFL**) of the garden would be at RL9.7 m. Therefore, allowing for some excavation below the FFL, Mr Speechley noted the excavation depth below the top of the capping beam would be about 1.6 m. Mr Speechley said that as the near side of the northern most parterre garden (in the Northern Light Well) was abutting the Retaining Wall, the excavation

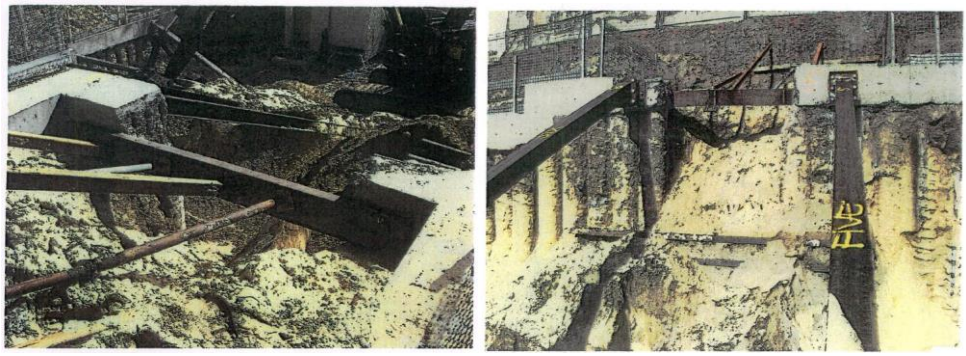
would need to be supported until the permanent concrete parterre was constructed. Mr Speechley recommended a procedure for support of the excavation of the Northern Light Well, confirming discussions on site.

92 In the 7 October Report, Mr Speechley recommended as follows:

- The piles on the eastern side of the parterre garden, being those that formed part of the line of the Shoring Wall, had been cut off short and the capping beam in that area had been removed and that should be rectified immediately. He understood that a “deep downturn beam” was to be constructed to connect with the top of the Shoring Wall.
- Prior to any excavation works within the parterre garden areas, a survey of the Retaining Wall must be carried out to check that it is performing as expected and excavation should not commence until the results of the survey have been reviewed by the geotechnical and structural engineers and approval to proceed has been provided.
- The structural engineers should inspect the Temporary Retaining Propping in the area of the northern most parterre garden and provide written confirmation that the propping is suitable to support the Retaining Wall. Co-ordination between the structural engineers from Hughes and Northwood would be required as additional loads may be placed on the shoring system, requiring additional propping.
- Push (rather than drive or hammer) channel sections internally into the four corners of the parterre garden area, which had to extend at least 2.6 m below the top of the capping beam and be fixed to the capping beam at the top. If they could not be pushed into place, then hand auger holes in which the channel sections could be placed and then backfill the holes.
- Excavate carefully by hand internally within the parterre garden and support the excavation progressively by using timbers sliding down with the excavation supported by the channel sections at either end.
- Form up and pour internal walls and floor slab.
- Provide waterproofing and drainage as required.
- Backfill between temporary shoring and permanent walls using no fines concrete.
- All works in the area should be carried out without delay and the Retaining Wall should be visually monitored at least daily during the works. If there is any concern at any point in the construction about the stability of the existing western boundary wall, further advice should be sought immediately.

93 Mr Speechley took further images during his site visit. The two images set out below show the Northern Light Well after having the capping beam partially removed and the Shoring Wall piles having been cut down. The top of the

waler beam is visible in the right-hand image, which is the partially buried horizontal beam between the piles:



A fully excavated image taken on 16 November 2010 is set out at **Appendix 1, figure J.**

J&K Observations About the Shoring Props

94 The 7 October Report then addressed the southernmost parterre garden (in the Southern Light Well) and proceeded to deal with other geotechnical observations in relation to the steel propping that had been installed along the Shoring Wall. Mr Speechley made comments to the following effect:

- Eight steel props had been installed along the straight part of the Shoring Wall with two additional props installed along the Northern Return Wall and one prop on the Southern Return Wall. The spacing of the propping along the Shoring Wall varied between 4.7 m and 2.4 m and the propping was inclined approximately at 1V:2H.
- He was not able to observe the Laterally Loaded Piles providing support for the steel propping but that his understanding was that it would have comprised either a single 600 mm diameter pile or two 450 mm diameter piles, for which a maximum allowable lateral load had been calculated. Therefore, the spacing of the steel propping observed did not seem adequate. He requested confirmation from Mr Walsh as to the piles used to support the steel propping and the adequacy of the propping system to support the lateral loads. Mr Speechley said that that should be carried out immediately.
- Now that the excavation was approaching bulk excavation level of RL6.6 m, particular care should be taken not to over-excavate or disturb the soils below the bulk excavation level. If any over-excavation occurs it must be backfilled immediately and that requirement must be communicated by the Builder to the excavation contractor.
- Observation of the footpath area between the Building and the Retaining Wall suggested that there could have been some additional movement although probably only minor. He recommended that a survey be carried out immediately on the Retaining Wall and recommended that additional support

be provided for long term stability. He said that that may be possible by propping with new garden walls and further advice should be obtained from the structural engineers and the Architect for options to suit the architectural requirements.

95 Mr Speechley sent the 7 October Report to the Builder by email, in which he said that the report should be read through carefully as there were actions required by the Builder. In the email, Mr Speechley said that he was still concerned about the overall stability of the Retaining Wall and recommended to the Builder that it be monitored by survey at least monthly until more permanent support could be provided for the long term.

96 Later on 7 October 2010, Mr Speechley sent a further email to the Builder confirming that the Builder must carry out the works with great care to avoid excessive disturbance to the soils under the capping beam and the footing of the Retaining Wall. He recommended that timbers be progressively placed one at a time as excavation proceeded (presumably as described above with the channel sections), saying that excavation should never extend more than 200 mm below the lowest placed timber. In that regard, it must be assumed that Mr Speechley was referring to the Northern Light Well/parterre garden.

8 October 2010 Northwood Plans for Temporary Removal of Shoring Props

97 On 8 October 2010, Mr Walsh provided to the Builder, under cover of a letter marked "Urgent", design sketches allowing temporary removal of Shoring Props 1, 2 and 3 and, after their reinstatement, the removal of Prop 5 and, after its reinstatement, the removal of Prop 7. Mr Walsh said that the work was required in order to facilitate the use of the drilling rig currently on site for the purpose of constructing the foundation piles that were located below the Shoring Props. He ended by saying that "inspection of the braces by a structural engineer **is** required **prior** to removal of props" (his emphasis). A copy of the sketches is set out at **Appendix 1, figure K**.

98 The Northwood designs enabled the temporary removal of Shoring Props by, among other things, installing braces made of 150UC23, a specific type of steel beam, which would diagonally connect specified Shoring Props that were not being removed. Northwood noted that the braces had to be inspected by a structural engineer prior to any props being removed. Once piling was

complete for the foundation piles under the removed prop, the removed prop could be reinstated and braces applied to different props to enable the removal of props in the other locations where piling had to take place.

99 That communication was prompted by the fact that the layout of the Shoring Props did not provide enough space between the props for Pile & Bucket to install the main building foundation piles because the piling rig could not work in the space between the Shoring Props. The result of the inadequate spacing was that Shoring Props had to be removed temporarily in order to create enough space for the piling rig. On 8 October 2010, Pile & Bucket sent an email to the Builder requesting a design for the process of removing props on a staged basis to enable access for the piling rig to the area under the props to install the foundation piles. The Builder responded attaching the Northwood sketches[12] to allow the drilling works for the foundation piles to take place.

9–11 October 2010 Preparation for Removing Shoring Props

100 On 9 October 2010, Mr Paterson of Pile & Bucket sent an email to Mr Frigo of the Builder acknowledging receipt of the "the structural detail variation to enable the [Shoring Props] to be removed for the foundation piles".
Mr Paterson said that the temporary prop removal work was not required to facilitate the use of the drilling rig "currently on site", as suggested by the covering letter to the Northwood design, as the work would be required under any circumstances irrespective of the drilling rig. Mr Paterson asked for "a connection detail for the 150UC23" in view of the requirement for an inspection of the braces prior to their removal. Mr Paterson also sought confirmation concerning the acceptability of materials for the bracing, noting that he had arranged for a 5 m section of 150 mm square by 10 mm thick steel section to be delivered and that although it was not a 150UC23, it could meet the same requirements.

101 On 11 October 2010, Pile & Bucket began installation of the braces in preparation for the commencement of installation of the foundation piles in accordance with the Builder's instruction.

[12] Noted above at [97] and set out at Appendix 1, figure K.

Installation of the Foundation Piles and Removal of Shoring Props

102 Installation of the foundation piles commenced on 18 October 2010. Shoring Prop 7 was removed on 19 October 2010. On 22 October 2010, Pile & Bucket hit rock at a depth of 9.2 m and was requested to await redesign of that section. On 27 October 2010, Pile & Bucket received a Hughes redesign for the site where rock was hit. On 27 October 2010, Shoring Prop 5 was removed after Prop 7 had been replaced. On 2 November 2010, Props 1, 2 and 3 were removed after Prop 5 had been restored. Mr Walsh of Northwood was present to inspect the props prior to their removal. The site report records that Mr Walsh gave instructions for grout and quick set concrete. The foundation piles were installed in accordance with the instructions provided by Northwood to the Builder on 8 October 2010. All of the foundation piles had been completed by 4 November 2010.

NMK Excavation of Foundation Piles

103 The Builder's site diaries indicate that, between 5 and 11 November 2010, NMK performed excavation for a number of foundation caps on the Manning Road side of the Shoring Wall located to the north of the lift well. Mr Paterson of Pile & Bucket suggested that that excavation was deeper and wider than the work undertaken by Pile & Bucket.

Excavation of the Lift Pit by Pile & Bucket

104 On 29 October 2010, Pile & Bucket carried out excavation for the lift pit to a depth of approximately RL4.65 m. That was done at the direction of the Builder and was below the bulk excavation limit of RL6.6 m that Mr Speechley had specified on 8 September 2010[13] and at other times. In the Northwood designs, the lift pit was located directly next to the Shoring Wall and partially overlapped the piles forming part of the Northern Light Well. An undated photograph set out at **Appendix 1, figure L** shows the lift pit excavation in front of the Northern Light Well area.

The Survey Monitoring Records

105 The survey monitoring records of 7 October 2010 had shown no change in horizontal movement at nine stations and a movement of 7 mm at one station

[13] See above at [83].

(station “MP03”), being the station where a horizontal movement of 7 mm had earlier been observed on 8 September 2010. It appears that the monitoring data displayed the movement as a cumulative total as opposed to movement detected from the last monitoring data point. Thus, the station MP03 showed no new movement as having occurred between 8 September 2010 and 7 October 2010. No vertical movement was recorded on either 8 September 2010 or 7 October 2010. The records for 8 November 2010 show horizontal movement at three stations of 12 mm (MP03), 16 mm (MP04) and 5 mm (MP05) and vertical movement at four stations of 7 mm (MP03), 12 mm (MP04), 5 mm (MP05) and 5 mm (MP08). Records of observation on 10 November 2010 record horizontal movement at four stations of 13 mm (MP03), 21 mm (MP04), 11 mm (MP05) and 5 mm (MP08) and vertical movement at the same stations of 9 mm, 14 mm, 7 mm and 7 mm respectively. The movements that occurred within each monitoring period are summarised in the following table:

Period	**Point**	**Horizontal Movement**	**Vertical Movement**
5 August 2010 – 8 September 2010	MP04	7 mm	-
8 September 2010 – 7 October 2010	No further movement		
8 October 2010 – 8 November 2010	MP03	12 mm	7 mm
	MP04	9 mm	12 mm
	MP05	5 mm	5 mm
	MP08	-	5 mm
8 November 2010 –	MP03	1 mm	2 mm

10 November 2010	MP04	5 mm	2 mm
	MP05	6 mm	2 mm
	MP08	5 mm	2 mm
After 10 November 2010	No further movement		

Cracking Complaints and Response

11 October 2010 Architect Notes Neighbour Concerns about Cracking

106 On 11 October 2010, the Architect sent an email to Hughes saying that the Builder was encountering "some neighbour concerns with regard to cracking". The Architect asked Hughes to forward to the Builder all dilapidation reports for the project. On the same day, Hughes replied "no problem, we will arrange that". The primary judge concluded that Hughes did in fact send the dilapidation reports as requested.[14]

107 There is no evidence as to the nature of the "neighbour concerns" or how they were communicated to the Builder. Nor is there any evidence as to what steps, if any, the Builder took upon receipt of the dilapidation reports. The dilapidation reports were not in evidence although it was common ground that some cracking was evident in the Building before the commencement of the Shoring Works.

Lawyers for the Unit Owners Correspond with Builder About Cracking

108 On 4 November 2010, Messrs CE Chapman & Co, lawyers, sent an email to the Builder on behalf of Ms Roslyn Bainton, one of the Unit Owners. Chapman & Co said that Ms Bainton had been overseas for about one month and that, upon her return on 1 November 2010, she had discovered cracking to walls, cracking to timber door architraves and the separation of cornices and skirting boards from the walls in her unit. Chapman & Co said that Ms Bainton had spoken to the occupants of several other units in the Building, who also

[14] The Owners – Strata Plan 30791 v Southern Cross Constructions (ACT) Pty Ltd (in liq) (No 2) [2019] NSWSC 440 at [447] ("Primary judgment").

reported damage to their units. Chapman & Co said that, in addition, there was damage and cracking to the exterior of the Building. Chapman & Co said that Ms Bainton believed that the damage had been caused by the construction work on the Development Property and that it was in the Builder's interests to consider ceasing work on the site in order to minimise the risk of ongoing damage.

109 That is the first written communication in evidence of any complaint on behalf of any of the appellants. There was no further evidence as to the "neighbour concerns" encountered by the Builder, as referred to in the Architect's email to Hughes of 11 October 2010.[15] The primary judge drew the inference that one or more of the residents of the Building had expressed "concerns". Clearly enough, the Architect had in mind the dilapidation reports referred to above, which had been prepared by Hughes sometime before.[16] If cracking had occurred in the Building as early as 11 October 2010, that damage must have been caused by movement on or prior to that date, although later activity may have caused further movement and further damage. However, there is no evidence identifying that part of the damage to the Building that was caused by events on or before 11 October 2010 and any part of the damage that was caused by events after that time, such as, for example, the lift pit excavation, which initially took place on 29 October 2010.

5 November 2010 Hughes Inspection of Lift Pit

110 On 5 November 2010, Hughes conducted an inspection of the lift pit. An inspection report refers to the placing of formwork against the edge of the lift pit to prevent collapse of the excavation.

6 November 2010 Builder Shown Cracking

111 The Builder's site diary for Saturday 6 November 2010 contains an entry to the effect that "Mark" from the Affected Property told Mr Frigo, of the Builder, that there was some cracking appearing along the footpath to the Development Property and that Mr Frigo observed cracking along the footpath and on the Building. The report stated that the cracking on the Building was existing

[15] See above at [106].
[16] See above at [29] and [106]–[107].

cracking that had been patched. However, Mr Frigo could not determine how bad it was before the work started because he did not have the dilapidation report on site. He made arrangements to get the dilapidation report on the following Monday.

8 November 2010 J&K Email to the Builder About Monitoring Results

112 On 8 November 2010, Mr Speechley sent an email to the Builder confirming discussions regarding the latest monitoring results of the Retaining Wall and commenting to the following effect:

- No works had been carried out in the immediate area of the Retaining Wall since the last monitoring period being 7 October 2010. In reference to the 7 October Report, the Builder had advised that the parterre gardens had not been constructed and that Hughes had not inspected and approved the existing Temporary Retaining Propping.
- Work in the area of the Retaining Wall should therefore cease and additional support works be installed immediately.
- The nature and integrity of services in the footpath on the Affected Property between the Retaining Wall and the Building should be checked.
- Mr Speechley understood that the Builder had arranged for an engineer (Mr Graeme Deaker) to visit the Development Property the following morning to assess the Retaining Wall movement and to provide further advice and that Northwood should be included in any propping or support works as it may have an effect on the Shoring Wall if the Shoring Wall was to be used for support for such propping.
- Mr Speechley understood that Mr Walsh had been inspecting the existing Shoring Props for the Shoring Wall on a regular basis and was satisfied with it. He said that the Shoring Wall had not been monitored and strongly recommended that the Builder begin monitoring that wall as well.

Builder Retains Mr Deaker and Constructs New Propping for Retaining Wall

113 Following the reports of cracking, the Developer retained another engineer, Mr Graeme Deaker. Mr Deaker visited the site on 9 November 2010. On 11 November 2010, Mr Deaker advised that the Retaining Wall should be propped to the Shoring Wall, and that additional propping be provided to the Shoring Wall connected to the lift shaft and other piled footings. On 12 November 2010, the Builder emailed J&K noting that the props to connect the Retaining Wall to the Shoring Wall had been delivered and were being installed that day. Thereafter, no further movement was detected.

The Cause of the Movement and the Joint Report

114 The Owners Corporation and the Unit Owners, as well as the Builder, Hughes, Northwood, Pile & Bucket and J&K, served opinion evidence, as to the cause of the damage to the Building, by structural and geotechnical engineers (**the Engineers**). All but one of the Engineers subsequently participated in a conclave. The Engineers who participated in the conclave were:

- Mr Simon Matthews, a structural engineer, retained on behalf of the Owners Corporation and the Unit Owners;
- Mr Andrew Shirley, a geotechnical engineer, retained on behalf of the Builder;
- Mr John Alden, a structural engineer, retained on behalf of Hughes;
- Mr Donald MacLeod, a structural engineer, retained on behalf of Pile & Bucket;
- Mr Rodney Broune, a structural engineer, retained on behalf of Northwood;
- Mr Simon Mortimer, a geotechnical engineer, retained on behalf of J&K;
- Mr Mark Manning, a structural engineer, also retained on behalf of J&K.

Following settlement of the claims against Northwood, J&K and Pile & Bucket, the Owners Corporation and the Unit Owners called those of the Engineers who had originally provided opinion evidence on behalf of Pile & Bucket and Northwood, while the geotechnical engineer retained by J&K was called by the Builder and the structural engineer retained by J&K was called by the Builder and Hughes.

115 The participants in the conclave were asked to identify any areas of agreement, identify any areas of disagreement and express their views as to apportionment of responsibility between the various defendants in the proceedings for any damage that may have been caused to the Building, together with reasons for the areas of agreement and disagreement. The Engineers produced a report of their conclave (**the Joint Report**).

Causation

116 The Engineers were unanimous that the damage to the Building was caused by the movement of the foundation strata under the Building and that the movement of the foundation strata was caused by a combination of movements of the Shoring Wall and the Retaining Wall.

117 The Engineers were unanimous that the movement of the Shoring Wall was the result of:

- inadequate design;
- removal and replacement of props;
- additional excavation below the general excavation depth at the lift pit and pile caps north of the lift pit; and
- cutting down of the piles in the Northern Light Well area.

118 The Engineers were unanimous that the movement of the Retaining Wall was the result of a combination of several factors, including movement of the Shoring Wall and inadequate temporary propping of the Retaining Wall. All of the Engineers, apart from Mr Shirley, agreed that the movement of the Retaining Wall was also the result of site excavation in front of the Retaining Wall on or about 30 July 2010 and "benching" excavation for piles.

119 Mr Shirley's reasons for disagreeing with the other Engineers were as follows

- there was no survey data prior to 5 August 2010 to support the proposition that the Retaining Wall moved;
- the excavation and material removal work undertaken by Pile & Bucket during the period 30 July 2010 to 3 August 2010 did not generally extend to near the footing of the Retaining Wall;
- a review of Pile & Bucket's photographs taken 30 July 2010 indicated that the excavation was not general excavation but excavation typical of an earthworks contractor checking the location and details of an existing footing, and where the Retaining Wall footing was approached, the excavation was relatively localised and that the width of the steep excavation near the footing is less than 700 mm.
- the structure of the Retaining Wall was such that it would be necessary to undermine or undercut the footing for a length of at least 5 m to have any significant impact on the Retaining Wall and photographs indicated that there was no such excavation;
- the movement of the Retaining Wall recorded on 8 September 2010 appeared to be related to the "benching" works for the Northern Light Well during the period 20 August 2010 to 23 August 2010.

120 The Engineers were unanimous that the additional excavation at the Northern Light Well involved cutting down of piles to the level of RL9.5 m without temporary support. That resulted in a loss of soil material from within the light well area and possible adverse impacts on the stability of the Retaining Wall and the Shoring Wall.

121 The Engineers were unanimous that the monitoring of the Shoring Wall, the Retaining Wall and the Building was inadequate, particularly bearing in mind the use of a “passive” system of excavation support. As a consequence, the opportunity to mitigate or minimise the damage to the Building was lost. The lack of sufficient survey and vibration monitoring limited the ability of the Engineers to assess fully the structure and wall movement history.

122 The Engineers were also unanimous that the lack of clarity of the various roles of the involved parties in the construction process and clear lines of responsibility were significant factors in the Building damage that occurred.

Responsibility

123 The Joint Report then dealt with the responsibility of the various parties. The Engineers repeated their unanimous conclusion that the lack of clarity of the various roles of the parties involved in the construction processes and clear lines of responsibility were significant factors in the damage to the Building that occurred. The Engineers repeated their conclusion that the damage to the Building was caused by the movement of the foundation strata under the Building and that that movement was caused by a combination of movements of the Shoring Wall and the Retaining Wall. They then expressed their unanimous conclusion as to the reasons for the movement of the Shoring Wall.

Responsibility for Movement of the Shoring Wall

124 First, inadequate design was a significant factor in the cause of the damage to the Building. With respect to that factor, the Engineers considered that the design had been prepared by Northwood with assistance from J&K. They considered that the Northwood design, including the pile depths, should have incorporated accurate information on the site excavations, lift pits et cetera.

125 Secondly, with respect to the removal and replacement of the Shoring Props, the Engineers unanimously concluded that that was an integral part of the Northwood final design. They concluded that J&K was not involved with the prop removal and replacement process.

126 Thirdly, in relation to the additional excavation depth over the general excavation level at the lift pit and pile caps north of the lift pit, the Engineers repeated their conclusion in relation to inadequate design. That is to say, they

considered that the design had been prepared by Northwood, with the assistance of J&K.

127 Fourthly, in relation to the cutting down of the piles in the Northern Light Well area, the Engineers unanimously agreed that it would be usual construction practice to install the waler beam prior to cutting down a capping beam and the associated piles. They observed that Pile & Bucket had commenced cutting down the capping beams on 20 September 2010 and that the Builder directed Pile & Bucket to install the waler beam on 28 September 2010.

Responsibility for Movement of the Retaining Wall

128 The Engineers then dealt with responsibility for the movement of the Retaining Wall. They repeated what was said above in relation to the cause of the movement of the Retaining Wall, including the dissent of Mr Shirley. They repeated what was said in relation to the responsibility for the movement of the Shoring Wall.

129 The Engineers then addressed the inadequate Temporary Retaining Propping and noted that J&K had recorded their concerns as to the Temporary Retaining Propping in the 7 October Report and communicated their concerns to the Builder. The Joint Report referred to practice note G8 on the Hughes plan "S02(1)", which said:

> "The Builder is responsible for the adequacy of all temporary works including shoring, popping and bracing, and where necessary is to engage a structural engineer to design and certify his temporary works."

The Joint Report noted that the status of that issue of responsibility was not agreed.

130 Mr Broune expressed the opinion that the Northwood scope of work specifically excluded the Retaining Wall for the following reasons:

- Northwood's letter of 26 February 2010 to the Developer did not offer any services related to structural elements other than the Shoring Wall. Item 2 of the letter only included the identification of possible savings that may be won by amendment of the existing basement layout and retaining walls; and
- Northwood's letters of 16 March 2010 and 24 March 2010 to the Developer noted that Hughes remained responsible for footings, columns, pits, structure outside the main wall lines forming terraces, pathways and general landscaping.

Mr Broune considered that that demonstrated the clear understanding of Northwood that its scope was limited to the Shoring Wall only.

131 Mr Alden responded that the Retaining Wall was an existing structure and that the documents identified by Mr Broune did not contain any specific exclusion of the stability of the wall from Northwood's scope of work. He considered that, given that the purpose of the Shoring Wall was to support the ground strata behind the Shoring Wall in order to prevent any movement of the ground strata that would cause damage, other than perhaps minor cosmetic damage or instability, it would not be possible to design the Shoring Wall properly without consideration of that issue as an integral part of the design process. He considered, therefore, that it would not be possible for the designers of the shoring system to exclude from the scope of work due consideration of the stability of the Retaining Wall.

132 Mr Alden referred to the loss of soil due to the premature cutting down of the piles at the Northern Light Well and the height of the Shoring Wall relative to the Retaining Wall as relevant to the temporary propping of the Retaining Wall. By that, Mr Alden was referring to a part of the final Northwood designs that showed a requirement for temporary shoring at the Northern Light Well to prevent collapse of soil when the wall piles at this location are cut down, and prior to any excavation. He referred to photographs[17] showing that no such shoring had been established: rather, the soil was simply left to spill through the gap created by the cut piles.

133 Mr Shirley also responded to Mr Broune's comments, noting that the structure designed by Northwood was an earth retaining structure and was thus covered by a certain Australia Standard. Therefore, he said, it was incumbent on the designer of the Shoring Wall to consider and take into account the adjoining ground, including any affected structure. Mr Shirley noted his agreement with Mr Alden on that issue.

134 The Engineers were unanimous that the work of the light well excavation involved the cutting down of piles to the level of about RL9.5 m, without temporary support, which resulted in a loss of soil material from within the light

[17] Set out above at [93].

well area and possible adverse impacts on the stability of the Retaining Wall and the Shoring Wall. In relation to the loss of soil material and possible adverse impacts, they repeated that it would be usual construction practice to install the waler beam prior to cutting down a capping beam and the associated piles.

135 In dealing with monitoring, the Engineers repeated that the monitoring of the Shoring Wall, the Retaining Wall and the Building was inadequate. They then referred to the Monitoring Plan (the vibration, hydrological and geotechnical monitoring plan), as prepared for the Developer by J&K, and observed that survey monitoring of the Retaining Wall commenced on 5 August 2010. They referred to the fact that Mr Speechley was requested by the Builder on 6 September 2010 to carry out the monitoring required by the Monitoring Plan but that it was not clear as to when the J&K report of 2009 was provided to the Builder.

136 With respect to the allocation of percentage responsibilities, all the Engineers (aside from Mr Shirley) considered that the issue of responsibility involved matters other than technical engineering issues, such as matters of contract and contractual issues and other legal considerations, and that such matters were outside the area of expertise of those who participated in the conclave and were matters for the Court. Those Engineers considered that apportionment of responsibility could not reasonably be addressed from a technical standpoint in isolation from the contractual and legal issues. They concluded by saying that they had identified the parties associated with various technical issues without any allocation of percentage responsibilities.

137 Mr Broune expressed the opinion that the insufficient survey and vibration monitoring undertaken and the subsequent inability of the Engineers to assess fully the structure and wall movement history, as indicated above, meant that the actual contribution of each physical cause of the damage to the Building identified above could not be identified.

138 The primary judge noted that the view of the Engineers about the role played by the temporary propping to the Retaining Wall (noted at [129]) appeared to have been born of a misunderstanding of the 7 October Report. Further, his

Honour found that, although it may have been bad practice to have left the cut down part of the Shoring Wall relatively unrestrained for the 10 day period between 20 and 30 September 2010, the survey monitoring on 8 October 2010 showed no movement in the Retaining Wall between 8 September 2010 and 7 October 2010. By the conclusion of the hearing, counsel for the Owners Corporation and the Unit Owners accepted that the cutting down of the piles in the Shoring Wall was not causative of any damage to the Building and could be put to one side.[18]

The Claims Made by the Owners Corporation and the Unit Owners

139 The allegations made in the fourth further amended technology and construction list statement, filed on 20 November 2018 (**the Statement of Claim**), may be restated as follows:

(1) the Owners Corporation is the registered proprietor of the common property in Strata Plan 30791 and the Unit Owners are respectively the owners of lots in that strata plan;

(2) the Building is erected on the Affected Property;

(3) the Development Property has an adjoining boundary with the Affected Property;

(4) between 2 October 2007 and 27 June 2011, the Council approved a development application in respect of the Development Property;

(5) at all material times the Builder carried on business as a builder of residential buildings and was engaged by the Developer under the construction contract to execute and complete building works on the Development Property and in the second half of 2010 commenced building works in pursuance of the Development Approval granted by the Council;

(6) at all relevant times, Hughes carried on business as a geotechnical engineer and was engaged as contractor by either the Developer or the Builder as a structural engineer for the development project that was the subject of approval by the Council to prepare and devise plans, including piling plans, designs, specifications and methodologies for the carrying out of all excavation, piling and shoring work for use on the Development Property;

(7) the Builder undertook work on the Development Property that included the Shoring Works;

(8) Hughes undertook the Design Works;

[18] See Primary judgment at [148], [244].

(9) the Shoring Works carried out and effected by the Builder on the Development Property and the Design Works carried out and effected by Hughes caused structural and aesthetic damage to the Affected Property and the Building and is continuing to cause structural and aesthetic damage to the Affected Property and the Building;

(10) at all material times, the Builder knew or ought to have known that each of the Owners Corporation and the Unit Owners would suffer loss and damage if reasonable care, skill and diligence was not exercised by the Builder in carrying out or instructing, controlling and supervising the Shoring Works on the Development Property;

(11) the relationship between each of the Owners Corporation and the Unit Owners, on the one hand, and the Builder, on the other hand, was such that the Builder owed to each of them a duty of care:

- in carrying out or instructing, controlling and supervising the Shoring Works;
- in properly and accurately instructing all persons engaged to carry out the Shoring Works in a good and workmanlike manner and in accordance with all proper instructions and directions so as not to cause damage to adjoining land;
- in regularly supervising and inspecting the Shoring Works to ensure that the Shoring Works were in fact carried out and effected in a good and workmanlike manner and in accordance with all proper instructions and directions; and
- in identifying and taking action to rectify any departures from good and proper building practices and workmanship and from all proper instructions and directions as provided from time to time.

(12) in breach of the duty of care referred to above, the Builder caused or permitted the Shoring Works to be carried out negligently;

(13) at all material times, Hughes knew or ought to have known that each of the Owners Corporation and the Unit Owners would suffer loss and damage if reasonable care, skill and diligence was not exercised by Hughes in carrying out the Design Works;

(14) the relationship between each of the Owners Corporation and the Unit Owners, on the one hand, and Hughes, on the other hand, was such that Hughes owed to each of them a duty of care:

- in carrying out the Design Works;
- in properly and accurately instructing all persons engaged to prepare or assist in the preparation of the Design Works in a competent, good and workmanlike manner;
- in regularly supervising and inspecting the Shoring Works to ensure that the Shoring Works were in fact carried out and effected in a good and workmanlike manner and in accordance with the Design Works and in accordance with all proper instructions and directions; and
- in identifying and instructing all persons engaged to undertake or supervise the Shoring Works to take action to rectify any departure from the Design Works

and from good and proper building practices and workmanship and from all proper instructions and directions as provided from time to time;

so as to ensure that the Shoring Works undertaken on or beneath the Development Property in reliance upon the Design Works did not, and would not, cause damage to the Affected Property and the Building on adjoining land.

(15) in breach of the duty of care referred to above, Hughes caused or permitted the Design Works to be carried out negligently;

(16) further and alternatively, each of the Builder and Hughes had a statutory duty of care pursuant to s 177 of the *Conveyancing Act 1919* (NSW) not to do anything, or permit anything to be done, on or in relation to the Development Property that removed the support provided by the Development Property to the Affected Property;

(17) in breach of that statutory duty, the Builder caused or permitted withdrawal of proper and sufficient lateral support to the Affected Property;

(18) in breach of the statutory duty referred to above, Hughes caused or permitted the withdrawal of proper and sufficient lateral support to the Affected Property;

(19) in consequence of the breaches by each of the Builder and Hughes of its duty of care and the statutory duty of care, the Owners Corporation or each of the Unit Owners has suffered loss and damage and continues to suffer loss and damage;

(20) the Builder is liable to the Owners Corporation and the Unit Owners for the loss and damage caused by reason of breaches of duty of care and breaches of statutory duty by the Builder; and

(21) Hughes is liable to the Owners Corporation and the Unit Owners for the loss and damage caused by reason of the breaches of duty of care and breaches of statutory duty by Hughes.

140 The statement of claim sets out some 28 paragraphs of particulars of negligence on the part of the Builder and some 38 paragraphs of particulars of negligence on the part of Hughes. Many of those particulars were not pressed before the primary judge. It will be necessary to address each of the particulars that was pressed by the Owners Corporation and the Unit Owners. Since the only claims made by the Owners Corporation and the Unit Owners against both the Builder and Hughes alleged negligence, there is no need to consider questions of trespass or nuisance as a basis for liability.

141 In their respective defences, each of the Builder and Hughes denies negligence on their respective parts. In addition, each claims that any liability

that it may be held to have to the Owners Corporation and the Unit Owners should be reduced by operation of the proportionate liability provisions of the *Civil Liability Act 2002* (NSW). All parties agreed that questions of proportionate liability should be deferred until after the Court publishes its conclusions concerning the primary liability of the Builder and Hughes.

Particulars of Negligence Alleged Against the Builder

142 The particulars of negligence that were pressed by the Owners Corporation and the Unit Owners against the Builder may be restated as follows:

(a) failure to obtain any, or any adequate, advice (whether geotechnical or otherwise) on the type of subsurface materials around and beneath the footings and foundations for the Building;

(b) failure to obtain any, or any adequate, advice (whether geotechnical or otherwise) as to the likely effect of the Shoring Works on the existing footings and foundations of the Building;

(c) failure to take any, or any adequate, account of the fact that the Affected Property and the Development Property were underlain by subsurface materials highly susceptible to displacement and settlement;

(d) failure to underpin and/or stabilise the soils or subsoils beneath the Affected Property and the Building;

(e) failure to brace and/or stabilise the Retaining Wall;

(f) permitting, or acquiescing in, excavation work occurring behind the Shoring Wall for a light well without the provision for adequate temporary shoring;

(g) failing to comply with condition B9 of the Development Approval requiring compliance with the recommendations of the geotechnical and hydrogeological reports;

(h) the capping beam on the Shoring Wall was demolished and the contiguous piles were lowered for the length of the Northern Light Well, which required local excavation of the earth berm supporting the Shoring Wall, resulting in a loss of lateral support to the Shoring Wall, and of the earth supporting the Retaining Wall within the zone of influence for the footings of the Retaining Wall and the footings for the Affected Property;

(i) carrying out excavation for the capping beam, stair and light wells within the zone of influence for the footings of the Retaining Wall without any shoring system being in place to provide lateral support to the Retaining Wall;

(j) the propping of the Retaining Wall in the vicinity of the excavation of the earth supporting the Retaining Wall to the length of the Northern Light Well was inadequate and was installed without obtaining any or any adequate advice from a structural engineer.

The allegations of breach of the statutory duty of care under s 177 of the *Conveyancing Act* were the same as set out above.

Particulars of Negligence Alleged Against Hughes

143 The particulars of negligence that were pressed by the Owners Corporation and the Unit Owners against Hughes may be restated as follows:

(a) Hughes' design provided for light wells, also referred to as parterre gardens, in areas between the Shoring Wall and the Retaining Wall, which removed support to the Retaining Wall and the Affected Property, and without specifying adequate precautions to provide replacement support;

(b) Hughes' design provided for excavation works for the foundation piles on the Development Property without regard to Northwood's design of the Shoring Wall and the location of the supporting props;

(c) Hughes' design provided for a lift shaft adjacent to the Shoring Wall, which removed support to the Shoring Wall, and consequently the Retaining Wall and the Affected Property and without specifying adequate precautions to provide replacement support;

(d) failure by Hughes to provide advice as to the need for modifications of its design, or sequencing of the works on the Development Property to account for Northwood's design of the Shoring Wall;

(e) failure by Hughes to have regard to, and/or take appropriate action consequent upon, survey monitoring on 8 September 2010 showing movement of the Retaining Wall and reports by occupants of the Building of cracking to the Building on 11 October 2010, which would have avoided the damage, or the extent of the damage, to the Building and improvements on the Affected Property.

144 The allegations of breach of the statutory duty of care under s 177 of the *Conveyancing Act* were the same as set out above.

Conclusions of the Primary Judge

145 Section 5D(1)(a) of the *Civil Liability Act* requires that the breach of duty complained of by a plaintiff is a necessary condition of the harm suffered by the

plaintiff. A necessary condition is one that must be present for the occurrence of the harm. However, there may be more than one set of conditions necessary for the occurrence of particular harm. A defendant's negligent act or omission that is necessary to complete a set of conditions that are jointly sufficient to account for the occurrence of the harm may well meet the test of factual causation within the meaning of s 5D(1)(a).[19]

146 The primary judge held, however, that it does not follow from that proposition that it is sufficient for the Owners Corporation and Unit Owners to point to a factor that the Engineers agreed caused the damage to the Building. While his Honour accepted that the Engineers came to a unanimous view about the cause of the movement of the foundations of the Building, his Honour held that evidence of a physical cause did not necessarily establish causation for the purposes of negligence under the *Civil Liability Act* but that, in addition, a causal connection between the breach and the damage must be established. The critical question, his Honour said, was whether a failure to exercise reasonable care by the Builder or Hughes caused the movement of the foundations under the Building. His Honour then dealt with the bases upon which it was alleged that the Builder and Hughes breached their respective duties. His Honour dealt with the eight ways in which it was contended in closing submissions that the Builder breached its duty and the five ways in which it was contended that Hughes breached its duty.

Claims of Breach Against the Builder

147 **The first claim** against the Builder was that it failed to comply with conditions of the Development Approval obtained by the Developer, specifically, that the Builder did not ensure that a geotechnical engineer "assessed the requirements for underpinning" the Building prior to demolition of the Old Block. His Honour found that the Builder retained J&K and that J&K considered and rejected the idea that there should be underpinning of the Building. The primary judge could not conclude that the Builder owed a duty of care to the Owners Corporation itself to consider the question of underpinning, or to obtain advice from a geotechnical engineer other than Mr Speechley.

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[19] See Strong v Woolworths Limited (2012) 246 CLR 182 at 191–192; [2012] HCA 5 at [20] (French CJ, Gummow, Crennan and Bell JJ).

148 The primary judge concluded that, in those circumstances, the Builder did not owe the duty contended for, that there was no breach of any such duty and that no such breach caused loss. Based on the expert opinion of the Engineers, underpinning would not have been recommended had another engineer been engaged. His Honour was not persuaded that, had the Builder engaged another geotechnical engineer, the damage suffered would have been mitigated or prevented.

149 **The second claim** dealt with by the primary judge was that the Builder failed to ensure that there was no undermining or destabilising of the Retaining Wall and that the Builder directed and took part in the excavation in front of the Retaining Wall on 30 July 2010 without first obtaining any geotechnical engineering advice on that excavation. His Honour accepted the conclusion of each of the Engineers that that excavation did not lead to any damage to the Building. Accordingly, even if there were a want of reasonable care by the Builder, there was no evidence that any such want of care caused damage to the Building.

150 **The third claim** dealt with by the primary judge was the allegation that the Builder failed to carry out any adequate site survey monitoring and failed to implement the J&K geotechnical Monitoring Plan. His Honour found that the Builder failed to take reasonable care in that regard and accepted that the Engineers agreed that the monitoring was inadequate and that, as a consequence, the opportunity to mitigate or minimise the damage to the Building was lost. However, his Honour concluded that, in view of the agreement by the Engineers that the work done on the Development Property prior to 5 August 2010 had no effect on the Building, the absence of monitoring prior to that day was of no consequence. His Honour concluded that the Owners Corporation and the Unit Owners had not established that the failure of the Builder to implement the Monitoring Plan caused any damage to the Building.

151 **The fourth claim** was that the Builder directed Pile & Bucket to commence work on the construction of the Shoring Wall in accordance with the Northwood sketches issued on 7 July 2010, without taking steps to maintain support to the

Retaining Wall. The primary judge referred to the drawing produced by Mr Walsh on 7 July 2010 showing that the top of the capping beam of the Shoring Wall was to be constructed at RL9.7[20] which had been incorporated into Pile & Bucket's subcontract for piling. In relation to submissions that a reasonable person in the Builder's position would not have directed Pile & Bucket to commence piling, his Honour found that at the site meeting held on 21 July 2010,[21] the Builder was directed by the Developer and the Architect to commence piling as soon as possible.

152 His Honour referred to the opinion expressed by all of the Engineers (except Mr Shirley) that the benching excavation done by Pile & Bucket down to RL9.2 m was the cause of movement to the Retaining Wall and hence damage to the Building. However, his Honour considered that that opinion was expressed as a result of misconception by the Engineers as to the nature of the benching excavation that Pile & Bucket carried out. His Honour referred to the unanimous opinion of the Engineers in concurrent oral evidence that the benching excavation carried out on 30 July 2010 had no effect on the Retaining Wall or the Building. That evidence was given after the relevant misconception had been resolved. His Honour was unable to find a failure to take reasonable care on the part of the Builder in that regard, nor that its conduct caused any damage to the Owners Corporation.

153 **The fifth and sixth claims** were dealt with together by the primary judge. The fifth was that the Builder directed the construction of piles and the capping beam to form the Northern Light Well, which required the carrying out of excavation within the zone of influence to the footings of the Retaining Wall, without putting in place any shoring system to provide lateral support to the Retaining Wall or obtaining any engineering advice. In the alternative, it was said that the Builder installed propping of the Retaining Wall in the vicinity of the excavation of the earth supporting the Retaining Wall for the length of the Northern Light Well that was inadequate and was installed without obtaining any engineering advice. The sixth allegation was a failure to adhere to the

[20] See partially set out above at [39].
[21] See above at [45].

recommendations in the 7 October Report to carry out all works in the Northern Light Well area as specified in that report without delay.

154 The Owners Corporation and Unit Owners contended that, by directing Pile & Bucket to carry out the excavation on 20 August 2010,[22] to install the formwork necessary to install the capping beam on the Northern Light Well and itself installing the Temporary Retaining Propping, the Builder was in breach of the duty of care that it owed to the Owners Corporation and Unit Owners. They contended that each of those breaches was causative of the damage to the Building. The primary judge found that there was no evidence that it was not necessary for the Builder to direct excavation in the immediate vicinity of the Retaining Wall or to remove the batters along the Retaining Wall in order to carry out the excavation. Further, his Honour found that there was no evidence that the Builder did not properly comply with Mr Theunissen's direction to reinstate the batters without delay.[23] Finally, his Honour found that the Engineers did not suggest in the Joint Report that the excavation caused movement in the Retaining Wall or damage to the Building.

155 Further, the primary judge found that there was no evidence of when, precisely, the Builder installed the Temporary Retaining Propping and that there was no evidence that it was not in place by 24 August 2010. His Honour found that it was in place on 8 September 2010, when Mr Speechley attended the Development Property, directed his attention to the Temporary Retaining Propping but expressed no misgivings about it.

156 The primary judge said that there was no expert evidence directed to any particular shortcomings in the Temporary Retaining Propping installed by the Builder and no evidence of what different or other propping a competent builder in the position of the Builder would have installed. His Honour referred to the opinion expressed by the Engineers in the Joint Report that the temporary propping was inadequate on the basis that J&K recorded their concern as to the Temporary Retaining Propping in the 7 October Report and communicated their concern to the Builder.[24] However, his Honour found that Mr Speechley

[22] The benching excavations near the light wells referred to at [78].
[23] See above at [80].
[24] See above [91].

was not expressing “concern” about the existing state of the propping but was advising that, before the soil within the proposed Northern Light Well was excavated, Hughes should inspect the propping to confirm that it was “suitable to support” the Retaining Wall in light of the “additional loads” that may be placed on the shoring system during that future excavation. His Honour considered that the conclusion by the Engineers that the Temporary Retaining Propping was “inadequate” arose from a misunderstanding by them of the 7 October Report, a matter that was not taken up in the concurrent oral evidence, during which they were not asked about the Temporary Retaining Propping.

157 The primary judge found that there was no evidence linking the 7 mm movement detected by the monitoring station MP04 between 5 August 2010 and 8 September 2010 to any shortcoming in the Temporary Retaining Propping. He referred to the agreement by the Engineers that, because of the sandy nature of the subsoil under the Development Property and under the Building, the underground impact of any activity on the Development Property would be immediate and once off and would occur almost instantaneously. His Honour referred to the many activities that took place on the Development Property between 5 August 2010 and 8 September 2010, including near MP04, such as the installation of the piles for the Northern Light Well and the Shoring Wall itself. His Honour found that any one of those activities could have caused the movement that was detected but no movement was detected between 8 September 2010 and 7 October 2010. His Honour said that, by the time further movement was detected, on 8 November 2010, the Temporary Retaining Propping had been in place for at least two months. His Honour therefore declined to conclude that the Temporary Retaining Propping was causative of that further movement. His Honour was not satisfied that the actions by the Builder in relation to the 20 August 2010 excavation and the installation of Temporary Restraining Propping were negligent or causative of any damage to the Building.

158 **The seventh claim** was that the Builder failed to ensure that the recommendations made by J&K in its geotechnical reports were followed in relation to the requirement not to excavate below RL6.6 m and directed Pile &

Bucket to excavate the lift pit in front of the Shoring Wall, which involved excavation below RL6.6 m and compromised the toe depth of the Shoring Wall.

159 The primary judge referred to the acceptance by the Engineers in the Joint Report that one cause of movement of the Shoring Wall was additional excavation depth over the general excavation level at the lift pit. However, his Honour referred to the acceptance by Mr Speechley in cross-examination that his reference to "bulk excavation" was not intended to be a reference to excavation that might be needed for particular services. He agreed that bulk excavation was not a reference to localised excavation where it might be necessary for services at a particular time. He said that, if there is a footing against the retaining wall or a lift pit against the retaining wall, that would have an impact on the retaining wall. In that regard, it appears that, in using the term "retaining wall" in that context, Mr Speechley was referring to the function of the Shoring Wall rather than to the function of the Retaining Wall. His Honour held that Mr Speechley did not intend, by his references to not conducting "bulk excavation" below RL6.6 m, to direct that, in no circumstances, should there be excavation below that level. Rather, his Honour said, Mr Speechley's point was that, if there was to be excavation below that level for a particular purpose, the impact on the Retaining Wall needed to be considered. That is to say, his Honour appears to have had in mind the way in which the Shoring Wall impacted on the Retaining Wall.

160 The primary judge said that there was no evidence to suggest that the Builder was not entitled to assume that the Shoring Wall was designed so as to accommodate the excavation necessary for the lift pit. Nor, his Honour said, was there any evidence of a different course that the Builder would have taken or that a reasonable builder in the Builder's position would have taken, had Mr Speechley's opinion been sought prior to the lift pit excavation. His Honour said that there was no evidence that the excavation itself was undertaken otherwise than in accordance with competent excavation practice.

161 The lift pit excavation took place on 29 October 2010 and, three days later, on 1 November 2010, Ms Bainton returned from overseas and noticed the damage to her unit. His Honour considered that it was unlikely that the damage

to Ms Bainton's unit occurred only on the day that she saw it and considered that it must have occurred sometime before. His Honour referred to the report by the Architect of "neighbour concerns" about cracking on 11 October 2010, which, his Honour considered, suggested that the damage had occurred sometime before Ms Bainton's return. In those circumstances, his Honour was not satisfied that it was only the lift pit excavation that caused the damage and that it was likely that there had been some earlier movement, having regard to the reports of cracking as early as 11 October 2010.

162 The primary judge then said that, if, as the Owners Corporation and Unit Owners contend, cracking in the Building attributable to the Shoring Works first occurred during October 2010, they suffered damage and loss then. His Honour considered that there was no evidence that enabled him to reach any conclusion as to what further damage occurred by reason of later events, such as the lift pit excavation. His Honour therefore concluded that the Owners Corporation and the Unit Owners had not established that any want of reasonable care by the Builder with respect to the excavation of the lift pit had caused damage to them nor what, if any, additional damage had been suffered because of the lift pit excavation.

163 Finally, **the eighth claim** of breach by the Owners Corporation and Unit Owners was that the Builder failed to ensure that the recommendations made by J&K in its geotechnical reports were followed in relation to not excavating below RL6.6 m and that the Builder directed NMK to excavate the foundation pile caps north of the lift pit, which involved excavation below RL6.6 m, which compromised the Shoring Wall. The primary judge characterised the case against the Builder concerning the foundation piles as being similar to its case concerning the lift pit, namely, that the Builder directed the excavation to be carried out below Mr Speechley's "bulk excavation" level of RL6.6 m.

164 The primary judge concluded that any damage that may have occurred as a result of the excavation in question was caused by the failure of Mr Walsh's design of the Shoring Wall to accommodate the excavation necessary to install the foundation piles. Further, his Honour said there was no evidence of what difference, if any, obtaining J&K's advice at that stage would have made.

Further, his Honour observed that the work was carried out on 4 and 5 November 2010, by which time cracking was manifest and the damage had been suffered. His Honour considered that there was no evidence that enabled him to come to any conclusion as to what further or different loss was caused as a result of NMK carrying out the excavation.

Claims of Breach Against Hughes

165 The primary judge then dealt with the allegations against Hughes. **The first claim** was that Hughes' design provided for light wells in areas between the Shoring Wall and Retaining Wall, which removed support to the Retaining Wall and the Affected Property without specifying adequate precautions to provide replacement support. It was submitted on behalf of the Owners Corporation and Unit Owners that Hughes breached its duty of care to them by preparing structural plans for the Northern Light Well in the area between the Shoring Wall and the Retaining Wall, which removed support to the Retaining Wall without specifying adequate precautions to provide replacement support and that a reasonable person in the position of Hughes would not have created the design of the structural elements of the Northern Light Well, which required excavation of the berm providing support for the Retaining Wall, without taking precautions or seeking advice so as to ensure that the Retaining Wall did not lose support.

166 The primary judge was not satisfied that Hughes did in fact prepare structural drawings from which the Northern Light Well was constructed. Further, his Honour considered there was no evidence of what precautions a competent structural engineer in the position of Hughes would have specified and that there was no evidence of how effective such precautions would have been to prevent such movement to the Retaining Wall and the Building as might have occurred as a result of the excavation and subsequent installation of the light wells.

167 Further, even if Hughes had been responsible for the design of the piling of the Northern Light Well and the excavation that subsequently occurred, the primary judge was not satisfied that those activities were a breach of its duty to take reasonable care or were causative of any damage to the Building. His Honour

referred again to the conclusion by the Engineers that they could not say that the excavation carried out at the site of the Northern Light Well caused damage to the Building.

168 **The second claim** against Hughes is that its design provided for a lift shaft adjacent to the Shoring Wall, which removed support to the Shoring Wall and consequently the Retaining Wall and the Affected Property, without specifying adequate precautions to provide replacement support. The primary judge considered that the short answer to that allegation was that Hughes' design did not provide for a lift shaft adjacent to the Shoring Wall. Hughes' original drawings, at the time of the retainer of Northwood, showed the Shoring Wall stepping outside the light wells. Thus, according to the design prepared by Hughes, the wall of the proposed lift well was not adjacent to the proposed Shoring Wall. It was Northwood's shoring design, a straight line, that had the effect that the Shoring Wall was to be adjacent to the wall of the lift shaft.

169 The primary judge was not satisfied that it had been shown that the scope of Hughes' duty of care included questioning whether Northwood's shoring design was adequate. Northwood had assumed responsibility for the design of the Shoring Wall and the proposed location of the lift well was determined long before Northwood altered the design of the Shoring Wall.

170 The primary judge referred to a revision of Hughes' 30 August 2010 footing plan of 8 October 2010 which, for the first time, included a "typical lift pit detail", which said that the depth of the lift pit was to be "to lift manufacturer's details". The revision did not otherwise give an indication of the depth of the lift pit. The primary judge could see no reason to conclude that it was necessary for Hughes to go further nor that a reasonable person in the position of Hughes would have gone further. His Honour found that there was no evidence that a competent structural engineer in the position of Hughes would have made more precise specification concerning the lift pit than it did. Further, his Honour said, there was no evidence of what further precautions a competent engineer in the position of Hughes would have specified nor the effect that implementation of such precautions would have had. His Honour saw no basis upon which he could conclude that a reasonable person in the position of

Hughes should have understood that the Northwood design had any shortcomings and would have taken precautions to compensate for those shortcomings. Finally, his Honour observed that there was a question of what further damage could be said to have been caused to the Building by the lift pit excavation, which occurred on 29 October 2010, referring to his comments concerning the claims against the Builder. His Honour rejected the claim for want of evidence regarding breach and causation.

171 **The third claim** against Hughes related to foundation piles that Hughes specified be installed adjacent to and in front of the Shoring Wall. The primary judge found that, as with the lift pit, the location of the foundation piles was determined long before Northwood was engaged to redesign the Shoring Wall. The primary judge held that there was no basis upon which he could conclude that Hughes had a duty to question whether the Northwood design of the Shoring Wall was adequate to accommodate the excavation necessary for the foundation piles. His Honour reiterated the Engineers' conclusion that Northwood's design of the Shoring Wall was inadequate as it did not make provision for that excavation. There was no evidence to show that a competent engineer in the position of Hughes would have detected this inadequacy in Northwood's design and have taken appropriate precautions. There was also no evidence of what such precautions would have been and their likely effect.

172 Again, his Honour found that by the time that the excavation for the foundation piles took place on 4 November 2010 and 6 November 2010, the movement of the foundations under the Building had already occurred. His Honour concluded there was no evidence enabling him to determine what further loss occurred as a result of any further movement attributable to the foundation excavation.

173 **The fourth claim** against Hughes determined by the primary judge was that its design provided for excavation works for the foundation piles on the Development Property without regard to Northwood's design of the Shoring Wall and the location of the Shoring Props. It was submitted that Hughes breached its duty of care by designing structural drawings of the foundation piles at the basement level without regard to Northwood's design of the

Shoring Wall and the location of the Shoring Props, so as to require the removal and replacement of the Shoring Props to construct the foundation piles.

174 The primary judge referred to the agreement by the Engineers that Northwood's design of the Shoring Wall should have catered for the need for the excavation necessary to install the foundation piles. The proposed location of those piles, and their dimensions, were established before Northwood's design and were never altered. Part of Northwood's design of the Shoring Wall involved the Shoring Props, the removal and replacement of which was one of the factors causing the Shoring Wall to move. His Honour saw no reason why Hughes' design should have adverted in terms to the location of those props. His Honour could not see how Hughes' design had any connection with, let alone caused, the replacement and removal of the Shoring Props. His Honour considered that the replacement and removal of the Shoring Props were primarily caused by Northwood's failure to heed Mr Paterson's communicated requirements concerning access. His Honour concluded that there was no breach on the part of Hughes regarding the location of the foundation piles.

175 Finally, in **the fifth claim**, the Owners Corporation and Unit Owners asserted that Hughes was negligent in failing to take appropriate action when informed of reports of cracking in the Building on 11 October 2010, by the email sent by the Architect to Hughes requesting that Hughes send to the Builder all the dilapidation reports. It was contended that Hughes was aware or ought to have been aware that the survey monitoring had recorded a 7 mm movement at MP04 between 5 August 2010 and 8 September 2010 and that a reasonable person in the position of Hughes would have investigated the complaints and, on substantiating the cracking, would have commenced an investigation of potential causes of the movement revealed by the survey monitoring. It was contended that, given the speed with which movement issues were resolved in November 2010, there was a strong possibility that the temporary shoring would have been recommended to the Retaining Wall, the Shoring Wall or both, which would have prevented the further damage.

176 However, the primary judge said, there was no evidence that Hughes knew of the monitoring results recorded on 8 September 2010. His Honour saw no reason why Hughes should itself have initiated an investigation into the reported cracking. The Architect did not ask Hughes to do anything other than to send the dilapidation reports to the Builder, which it did. Hughes was entitled to assume that the matter was being dealt with between the Architect and the Builder. His Honour rejected that claim.

The Appeal

177 The notice of appeal filed on 16 August 2019 identified 11 grounds of appeal. Ground 4 was not pressed and it was accepted on behalf of the Owners Corporation and the Unit Owners that Ground 10 was not a separate ground but argument in support of other grounds. Grounds 1, 7, 8 and 9 involved complaints against the Builder. Grounds 2, 3, 5 and 6 involved complaints against Hughes. Ground 11, which dealt with causation generally, involved both the Builder and Hughes. Each ground alleged a series of errors on the part of the primary judge, which made it almost impossible to identify the precise grounds of appeal relied upon. Accordingly, the Owners Corporation and Unit Owners were directed to provide a more precise note of the grounds of appeal. The reasons that follow deal with the grounds largely as explained in that note. It will be convenient to deal first with the grounds affecting the Builder and then the grounds affecting Hughes, before dealing with Ground 11.

Grounds in Relation to the Builder

Ground 1: Excavation of the Northern Light Well

178 The Owners Corporation and the Unit Owners assert that the Builder was negligent in directing Pile & Bucket to conduct the excavations for the Northern Light Well that commenced on 20 August 2010, because the excavation involved removing the earth berm supporting the Retaining Wall contrary to the advice in Mr Speechley's report of 4 August 2010. Further, they assert, the Temporary Retaining Propping was inadequate. They also make a related submission that the Builder did not comply with the direction from Mr Theunissen that all batters be reinstated without delay in accordance with the recommendations provided in Mr Speechley's report of 4 August 2010.

179 The primary judge said that there was no suggestion in the evidence that it was not necessary for the Builder:

- to direct excavation in the immediate vicinity of the Retaining Wall in order to accommodate the formwork necessary to construct the capping beam in the Northern Light Well; or
- to remove the batters along the Retaining Wall in order to carry out that excavation.

Further, his Honour considered that there was no evidence that the Builder did not promptly comply with Mr Theunissen's direction to reinstate the batters without delay. His Honour considered that, while Mr Speechley had made some comments about the berm in his note of 8 September 2010, following a site visit on that day, he did not suggest that Mr Theunissen's direction had not been complied with.[25] Further, Mr Frigo, of the Builder, was not questioned about that matter by counsel for the Owners Corporation and Unit Owners. His Honour observed that the Engineers did not suggest in the Joint Report that that excavation caused movement in the Retaining Wall or damage to the Building. The Owners Corporation and Unit Owners contend that his Honour erred in that conclusion and in failing to find that the excavation of the berm that was supporting the Retaining Wall on 20 August 2010 had an adverse effect on the stability of the Retaining Wall and in failing to find that there was movement of the Retaining Wall because of the excavation.

180 The Owners Corporation and the Unit Owners say that the primary judge erred in failing to find that the excavation of the earth berm that was supporting the Retaining Wall on 20 August 2010, in order to accommodate the formwork to construct the Northern Light Well, was contrary to the advice that had been given by J&K on 4 August 2010. They contend that his Honour erred in failing to find that the Builder breached its duty of care to them by excavating the earth berm that was supporting the Retaining Wall on 20 August 2010, regardless of whether the Builder promptly complied with Mr Theunissen's subsequent direction. They also say that his Honour erred in concluding that there was no evidence that the Builder did not promptly comply with that direction.

[25] Primary judgment at [163].

181 The Owners Corporation and the Unit Owners also assert that the primary judge erred in failing to find that, as the Temporary Retaining Propping was propped against the capping beam of the Northern Light Well, the Temporary Retaining Propping could not have been put in place until after that capping beam had been poured and had set and the formwork for the capping beam had not been set up until 23 August 2010. Thus, they say, his Honour erred in failing to find that the earth batters had been removed before the Temporary Retaining Propping had been installed and in failing to find that Mr Speechley had advised in the 7 October Report that all of the works in the Northern Light Well area, including the requirement for inspection and certification of the Temporary Retaining Propping, should be carried out without delay.

182 Further, the Owners Corporation and the Unit Owners say, the primary judge erred in failing to find that Mr Speechley's view that the Temporary Retaining Propping was inadequate was demonstrated by his immediately requiring that the Temporary Retaining Propping be inspected by the structural engineer when he learned on 8 November 2010 that the Builder had failed to carry out the works in the Northern Light Well noted in the 7 October Report, including the requirement for inspection and certification of the Temporary Retaining Propping.

183 In the Joint Report, the Engineers expressed the opinion that the Temporary Retaining Propping was inadequate, that the 7 October Report had recorded concern as to the Temporary Retaining Propping and that that concern had been communicated to the Builder. The primary judge, however, considered that Mr Speechley was not expressing concerns about the existing state of the propping but was advising that, before the soil within the proposed Northern Light Well was excavated, Hughes should inspect the Temporary Retaining Propping to confirm that it was suitable to support the Retaining Wall in light of the additional loads that may be placed on the shoring system during that future excavation. His Honour considered that the Engineer's conclusion that the Temporary Retaining Propping was inadequate arose from a misunderstanding of the 7 October Report. His Honour concluded there was no

evidence linking the 7 mm movement detected at MP04 between 5 August and 8 September 2010 to any shortcoming in the Temporary Retaining Propping.[26]

184 In that regard, the Builder points to the fact that, during the period between 8 September 2010 and 7 October 2010, no movement was detected by the vibration monitoring and contends that it should therefore be inferred that no movement in the sandy subsoil under the Building occurred during that period. Mr Frigo sent a plan to Mr Speechley following receipt of the 7 October Report and discussed it with him on the telephone. The Builder contends that it is clear from that evidence that the Northern Light Well had not been excavated at that time.

185 The Builder asserts that aspects of Mr Speechley's recommendations in the 7 October Report are consistent with its contention that the recommendations were intended to be followed at some time in the future when the Northern Light Well was excavated. Thus, it says, Mr Speechley referred to the procedure "recommended for support of the excavation for the northern most parterre garden". The Builder says that it is clear that the excavation had not yet occurred at that time. The Builder also asserts that the relevant recommendation about structural engineers inspecting the Temporary Retaining Propping was not made with any emphasis or urgency, as distinct from the recommendation concerning the piles that had been cut off short, which was in accordance with the Northwood design, that the matter should be "rectified immediately".

186 The Builder relies on the fact that, while the partial excavation of the batter to facilitate installation of the formwork necessary for the construction of the Northern Light Well capping beam was performed on 20 August 2010, the damage to the Building was not directly reported until early November 2010. The Builder asserts that the unanimous opinion of the Engineers was that any impact caused by works undertaken on the Development Property would have been "immediate and once off" following the completion of the works. The Builder asserts that the only finding reasonably available to his Honour was that there was no causal connection between the partial excavation and the

[26] Primary judgment at [362]–[373].

damage to the Building. It asserts that there was no evidence that the partial excavation in question was causative of the 7 mm movement detected at the monitoring point between 5 August 2010 and 8 September 2010, which significantly predated the first direct report of damage.

187 The Builder contends that the work that commenced on 20 August 2010 was done in accordance with structural engineering drawings prepared by Northwood and dated 19 August 2010 and with the further design work relating to the capping beam and piles around the Northern Light Well. The Builder supports the finding made by the primary judge that the 7 October Report referred to Mr Speechley's concern about future propping rather than the existing state of the Temporary Retaining Propping.

188 The Builder asserts that it is clear from the oral evidence of the Engineers that they were unable to say that the excavation caused damage to the Building, as distinct from potentially affecting the stability of the Retaining Wall. It contends that that is consistent with the finding made by the primary judge. The Builder also asserts that the partial excavation of the batter was an inherent part of the engineering design.

189 The conclusion of the Engineers, in the Joint Report, that the Temporary Retaining Propping installed by the Builder to support the Retaining Wall after the excavation was inadequate, is supported by Mr Speechley's recommendations in the 7 October Report and comments of 8 November 2010. Mr Speechley's recommendations in the 7 October Report, including the inspection of the Temporary Retaining Propping, were indeed made in reference to the future excavations of the Northern Light Well, which were still yet to occur. However, the thrust of Mr Speechley's advice was that "*all* works in the [Northern Light Well] area be carried out without delay" (my emphasis), pointing to a present concern over the existing support. The subject matter of "all works" in Mr Speechley's advice in the 7 October Report is significant. It involved conducting the excavation of the Northern Light Well in accordance with J&K's specified directions,[27] encompassing not only the "immediate" rectification of the piles and the capping beam that had been cut down, but also

[27] See above at [91]–[93].

the excavations and construction of the concrete parterre garden in the Northern Light Well.

190 Prior to setting out his recommendations, Mr Speechley noted that "the excavation will need to be supported in the temporary case until the permanent concrete parterre is constructed". Thus, the Temporary Retaining Propping had to be inspected by Hughes to confirm that it was capable of supporting the excavation, and a survey of the existing Retaining Wall had to be carried out. That would enable the excavation to commence (by hand), followed by forming and pouring the internal walls and floor slab for (for the parterre garden) then backfilling the space between the temporary shoring and permanent walls with concrete. It was those works that had to be carried out without delay. Mr Speechley also recommended that the Retaining Wall should be visually monitored daily during the works and that, if there was any concern about its stability, further advice should be sought immediately. The stability of that wall and the system supporting it was evidently a matter of concern.

191 On 8 November 2010, after noting that the parterre garden had not been constructed, nor the inspection of the Temporary Retaining Propping carried out, Mr Speechley commented that that work in the area of the Retaining Wall should cease and additional support works be installed immediately. He said that an engineer would visit the site to assess the wall movement and to provide further advice. He also said that Mr Walsh should be included in any propping or support works, as that may have an effect on the Shoring Wall if the Shoring Wall was to be used for support for those works. He observed that the Shoring Wall had not been monitored and strongly recommended that the Builder begin monitoring that wall as well.

192 Ground 1 relates to both the excavation around the Northern Light Well occurring between 20–23 August 2010, and the inadequate temporary propping of the Retaining Wall by the Builder. However, the Joint Report did not itself link the movement to the excavation of 20–23 August. It concluded that the inadequate temporary propping caused movement to the Retaining Wall and thus the substrata of the Building. However, the Engineers' oral evidence seems to suggest the excavation was destabilising. Also, there

appears to be a connection between inadequate temporary propping and the excavation such that, if there needs to be propping, which was found to be inadequate and causative of movement, there must have been some instability present, namely, the excavation itself, for which propping was required to give support.

193 Further, in relation to Ground 1, I consider that the primary judge erred in concluding that the Engineers misunderstood the recommendations in the 7 October Report, which related to whether Mr Speechley was indicating that the Temporary Retaining Propping was inadequate at the time he was observing it, or if he was simply suggesting that the temporary propping needed to be certified by an engineer prior to excavation of the Northern Light Well itself commencing. The issue arises as to whether or not the Builder was negligent in respect of the inadequate temporary propping to the Retaining Wall.

194 Acceptance that the conclusion about the 7 October Report was incorrect defeats the primary judge's conclusion that the inadequate propping of the Retaining Wall was causative of movement to the strata and the damage. The predominant reason for the primary judge concluding that there was no negligence concerning the Temporary Retaining Propping was his Honour's view that the Engineers who found that the inadequate support for the Retaining Wall caused the damage based their conclusion as to the inadequacy of the propping for the Retaining Wall upon the 7 October Report.

195 The consequence is that the adequacy of the Temporary Retaining Propping becomes more significant. On one view, the inadequacy is an extension of the improper excavation, since the two issues are connected. Thus, the excavation was negligent and destabilising, the temporary propping was inadequate to deal with that negligent excavation, and, therefore the negligent excavation was a breach.

196 The primary judge noted the causation difficulties in relation to the Temporary Retaining Propping and the damage, which were additional to his Honour's initial point that the Engineers had simply misunderstood the 7 October Report. His Honour appears to have concluded that, even if there was some breach of

duty in relation to the propping, namely, the excavation, there is a problem with showing that any such breach caused damage. Thus, there was a period of no movement from 8 September 2010 to 7 October 2010, after the excavation had occurred and temporary propping had been installed. Even if the 7 mm movement could be linked to the excavation, cracking of the Building was not reported until October 2010, during the monitoring for the period 8 October 2010 to 8 November 2010, which did display much movement. However, notwithstanding the monitoring evidence, the Engineers concluded that inadequate propping was the cause of the damage to the building.

197 For two reasons, it was an error to conclude that Mr Theunissen's direction to reinstate the batters to the Retaining Wall in accordance with the 4 August 2010 advice without delay had been adequately complied with, such that the Builder was not negligent. First, and more significantly, irrespective of whether the Builder did in fact comply with Mr Theunissen's advice, which was communicated on 23 August 2010, the excavation around the Northern Light Well had still commenced contrary to J&K's 4 August 2010 advice. Secondly, it is doubtful that Mr Theunissen's advice was adequately complied with, although the primary judge drew the inference that it had been followed based on the fact that Mr Speechley made no mention of the batters in his 8 September 2010 note. The 4 August 2010 advice was concerned with ensuring adequate support to the Retaining Wall was maintained. Had the batters been reinstated in accordance with that advice, one would not expect the extensive movement that was observed by the monitoring to have occurred. Thus, if the batters (or equivalent support) were properly reinstated such as to satisfy the J&K 20 August advice, then the subsequent movement empirically disproves that that was carried out or carried out adequately.

198 I consider that the primary judge should have found that the Builder was negligent in directing Pile & Bucket to conduct excavations around the Northern Light Well commencing on 20 August 2010, because the excavation involved removing the earth berm supporting the Retaining Wall contrary to the advice in Mr Speechley's report of 4 August 2010.

199 Ground 1 has been made out.

Ground 7: Excavation Below RL6.6m Contrary to Geotechnical Advice

200 The Owners Corporation and the Unit Owners assert that the Builder was negligent in directing its subcontractors to excavate the lift pit and pile caps for the foundation piles north of the lift pit to a level below RL6.6 m because J&K's construction analysis had only accounted for excavation to RL6.6 m. J&K advised the Builder on numerous occasions, including after designs have been prepared, that bulk excavation below RL6.6 m required further analysis, which did not occur. They say that, in those circumstances, the Builder was not entitled to assume that the designs of Hughes or Northwood, neither of which specified that they were suitable for excavation below RL6.6 m, were in fact suitable for excavation below RL6.6 m. They point to the fact that, in the Joint Report, the Engineers agreed that the over-excavation caused movement of the foundation strata and, therefore, materially contributed to the damage to the Building.

201 The primary judge considered that the Builder was entitled to assume that the Shoring Wall was designed so as to accommodate the excavation necessary for the lift pit. Further, his Honour considered there was no evidence of a different course that the Builder would have taken or that a reasonable builder in the position of the Builder would have taken, had Mr Speechley's opinion been sought prior to the lift pit excavation. Finally, his Honour considered that there was no evidence that the excavation itself was undertaken otherwise than in accordance with the competent excavation practice.

202 The primary judge considered that it was unlikely that the damage that Ms Bainton noticed occurred only on the day that she saw it. Rather, his Honour considered that it must have occurred sometime before she first saw it and referred to the report by the Architect on 11 October 2010 of "neighbour concerns" about cracking, which, his Honour considered, suggested that the damage had occurred some time before Ms Bainton's return. Ms Bainton noticed the damage on 1 November 2010. The lift pit excavation took place only three days earlier on 29 October 2010. In those circumstances, his Honour was not satisfied that it was only the lift pit excavation that caused the damage and concluded that it was likely that there had been some earlier

movement, especially considering there were reports of cracking as early as 11 October 2010, more than two weeks earlier.

203 The primary judge considered that, if, as the Owners Corporation and Unit Holders contended, cracking in the Building attributed to the Shoring Works first occurred during October 2010, the damage was caused then. His Honour considered that there was no evidence enabling him to reach any conclusion as to what further damage occurred by reason of later events, such as the lift pit excavation. Accordingly, his Honour concluded that the Owners Corporation and the Unit Holders had not shown that any want of reasonable care by the Builder with respect to the excavation of the lift pit had caused damage and had not shown what, if any, additional damage had been suffered because of the lift pit excavation.

204 The Builder says that the Owners Corporation and the Unit Owners appear to be contending that the advice of Mr Speechley was that no excavation was permitted under RL6.6 m and that the advice of Mr Speechley was not a limitation on all excavation, but the impact on the Retaining Wall needed to be considered but was not considered by the Builder. The Builder asserts those two propositions cannot stand together and that only the former was asserted before the primary judge. It says that, if the second proposition had been contended for before his Honour, it would have required expert opinion evidence as to what a reasonable builder in the position of the Builder would have done and there was no such evidence before his Honour. Where a point sought to be raised for the first time on appeal could have been met by calling evidence, it is not permissible to raise it for the first time on the appeal.[28]

205 The Builder contends that had such a point been raised before the primary judge, it is likely that it would have continued with a further line of cross-examination of Mr Speechley to establish at what point further analysis would have been required to consider the impact of such things as the lift pit and pile caps and whether Mr Speechley ought to have considered those aspects of detailed excavation in the analysis and whether those were always on the plan and known to Mr Speechley.

[28] See Suttor v Gundowda Pty Ltd (1950) 81 CLR 418 at 438; [1950] HCA 35.

206 The case of the Owners Corporation and the Unit Owners in relation to the first contention, which was actually advanced before the primary judge, rested on the erroneous proposition that the direction by Mr Speechley that "bulk excavation" was not to occur below RL6.6 m was a direction that no excavation could occur below that level without further analysis by J&K. The primary judge concluded that the effect of the relevant evidence was that Mr Speechley did not intend, by his references to not conducting "bulk excavation" below RL6.6 m, to direct that in no circumstances should there be excavation below that level. Rather, his Honour said, the point was that, if there was to be excavation below that level for a particular purpose, the impact on the Retaining Wall needed to be considered. The Builder asserts that that finding was open to his Honour and the Owners Corporation and Unit Owners have not explained why it was not or why his finding was erroneous.

207 The Builder relies on the finding by the primary judge that there was no evidence to suggest that the Builder was not entitled to assume that the Shoring Wall was designed so as to accommodate the excavation necessary for the lift pit. The Builder also asserts that there was no evidence of a different course that the Builder would have taken, or that a reasonable builder in its position would have taken, had Mr Speechley's opinion been sought prior to the lift pit excavation. Finally, the Builder says, there was no evidence that the excavation itself was undertaken otherwise than in accordance with competent excavation practice.

208 The Owners Corporation and Unit Owners relied on no evidence about what a reasonable builder would have done in the position of the Builder. Accordingly, they cannot contend that a contrary finding should have been made by the primary judge. Further, they did not advance any contention that the Builder should be held to be vicariously liable for the excavations performed by Pile & Bucket, let alone on what basis the Builder should be held vicariously liable.

209 The primary judge correctly found, in relation to the pile caps for the foundation piles, that any damage that may have occurred as a result of their excavation was caused by the failure of Mr Walsh's design of the Shoring Wall to accommodate the excavation necessary to install the foundation piles and

correctly found that the difficulty was that there was no evidence that obtaining J&K's advice at that stage would have made any difference. Ground 7 is not made out.

Ground 8: Failure to Comply with Development Approval Conditions

210 The Owners Corporation and the Unit Owners assert a number of errors with respect to the primary judge's findings concerning the Builder's compliance with the conditions of the Development Approval. The Development Approval contained a series of conditions, relevantly condition D10, which was in the following terms:

> "The *principal contractor* must ensure that a *professional engineer* determine the possibility of any adjoining buildings founded on loose foundation materials being affected by piling, peers or excavation. The *professional engineer* (geotechnical consultant) must assess the requirements of underpinning any adjoining or adjacent buildings founded on such soil on a case-by-case basis and the *principal contractor* must comply with any reasonable direction of the *professional engineer.*
>
> > **Note**: A failure by contractors to adequately assess and seek professional engineering (geotechnical) advice to ensure that appropriate underpinning and support to adjoining land is maintained prior to commencement may result in damage to adjoining land and buildings. Such contractors are likely to be held responsible for any damage arising from the removal of any support to supported land as defined by section 177 of the Conveyancing Act 1919. Standard condition: D6."

211 A preliminary issue concerning condition D10 is whether the obligation it imposed was limited to consideration of "traditional underpinning" of an affected property, or whether the obligation was more extensive and included consideration of any sort of support for adjoining buildings.

212 The primary judge observed that in concurrent evidence all the Engineers agreed that underpinning of the Building would not have been advisable, but noted that some of the Engineers were of the opinion that it may have been wise to consider stabilising the soil under the Building. However, his Honour considered that engagement of a professional engineer to investigate soil stabilisation was not what the condition required the principal contractor to do. Rather, condition D10 was directed, in terms, to underpinning. Mr Mortimer, one of the Engineers, would have construed the condition as meaning to put a system in place that ensured that damage did not occur on a neighbouring property. In that regard, Mr Mortimer, in oral evidence, said that he would have

considered that the condition could encompass soil stabilisation and could encompass the Shoring Wall. He speculated that the author of the condition was not a geotechnical engineer and was too specific in picking the word "underpinning". However, his Honour declined to take into account Mr Mortimer's speculation about those matters and held that the condition was directed, in terms, to underpinning only. It appears that soil stabilisation by grout injection is also occasionally referred to as "underpinning". However, that was not how the primary judge construed the term.

213 The Owners Corporation and the Unit Owners contended that it was an error for the primary judge to conclude that the condition "was directed, in terms, to underpinning only". In their submission, the condition extended beyond mere consideration of underpinning and required the Builder, prior to commencement of the development work, to ensure that a professional engineer determined the possibility of the Building being affected by piling, piers or excavation, to ensure that appropriate underpinning and support of the Affected Property was maintained. Thus, compliance with D10 would not be satisfied by obtaining a report of a geotechnical engineer that *only* assessed the requirements for traditional underpinning by piers. Instead, the condition embraced broader considerations, such as soil stabilisation.

214 The Owners Corporation and the Unit Owners submitted that the primary judge erred in failing to find that D10 imposed an obligation on the Builder to ensure that an engineer determined the possibility of any adjoining buildings founded on loose foundation materials being affected by piling, piers or excavation, and that the Builder failed to meet such an obligation. Thus, they say, the Builder, as principal contractor, should have retained its own geotechnical engineer to make the relevant assessment of the Affected Property and should not have relied on Mr Speechley, who was retained by the Developer. They then say that, if the Builder complied with D10, it would have retained a reasonably competent geotechnical engineer and that engineer would have advised the Builder of the requirement of soil stabilisation, by grout injection, which would have prevented the damage suffered to the Building. The basis of that submission was the fact that some of the Engineers suggested that they might

have recommended soil stabilisation, which might be referred to as underpinning by grout injection.

215 Thus, a preliminary question is whether, if the Builder had contracted a professional engineer, that engineer would have understood condition D10 as entailing consideration beyond what might be termed “traditional underpinning”, which uses piers. The condition refers simply to “underpinning” in the context of any adjoining buildings founded on loose foundation materials “being affected” by piling, piers or excavation. There is no reason to construe that reference to any particular form of “underpinning”. The object of the condition is to prevent damage to adjoining land or buildings from any proposed “piling, peers or excavation”. The reference to “excavation” is significant. Thus, the contractor must retain a professional engineer and comply with the engineer’s directions as to the steps that should be taken to avoid damage to the adjoining land or buildings as a result of the proposed excavation, as well as piling or piers.

216 While appropriate professional engineers were retained, in the guise of J&K, J&K was retained by the Developer, as opposed to the Builder as the principal contractor. Thus, the Builder contends that it could not be said that it was incumbent upon it to engage a further geotechnical engineer, in addition to J&K. Mr Speechley gave evidence that, as part of his usual practice, he gave consideration as to whether the Affected Property required underpinning or some other form of soil stabilisation, such as grouting. Regardless of whether Mr Speechley was correct in not recommending underpinning or soil stabilisation, any such failure on his part cannot be the responsibility of the Builder.

217 Although there may be a breach by the Builder in failing to retain its own professional engineer, the critical question is whether a geotechnical engineer retained by the Builder would have recommended grouting. The Owners Corporation and Unit Owners point out that, on 11 November 2010, following significant movements, J&K suggested that they would “need to consider some permanent stabilisation of the adjoining unit footings … (such as by grouting etc)”. A further email from J&K to Hughes also suggested that grouting the

sands could also be considered, in the context of stabilising the Retaining Wall, thus suggesting that grouting should have been in place.

218 The Builder contends that the proposition that, had it obtained its own geotechnical engineer, that engineer would have recommended underpinning, is contrary to the unanimous opinion of the Engineers that underpinning would not have been recommended. While some of the Engineers expressed opinions on the matter in their concurrent evidence and their individual reports, that question was not addressed in the Joint Report. A review of that evidence indicates that "traditional underpinning" was unanimously rejected, although there was some difference of opinion with respect to soil stabilisation.

219 Mr Shirley did not consider underpinning to be a valid option but thought that soil stabilisation of the sand strata, such as by sodium silicate grout injection under the footings of the Affected Property, was a valid option. Similarly, Mr MacLeod considered that underpinning and/or soil stabilisation should have occurred prior to construction. He said that, although there were difficulties with underpinning in loose sands, there were ways of achieving it, such as through grout injection, which he considered was a valid option. He expressed the view that Northwood, Hughes and J&K caused or contributed to the movement by failing to recommend underpinning and/or soil stabilisation under the Affected Property and the Retaining Wall at the northern end.

220 Mr Alden disagreed with Mr MacLeod. He considered that underpinning (or soil stabilisation below the footing) prior to commencement of work may appear to be a desirable course of action in hindsight, but looking from the period there were various problems with doing so. A detailed consideration of underpinning (or soil stabilisation) at the relevant time would have concluded that any such works, if proposed at all, should be restricted to the Retaining Wall.

221 Mr Manning considered that, as long as a Shoring Wall design was adequate, underpinning and soil stabilization were not needed. Mr Mortimer observed that underpinning required intrusive access to adjacent land to undertake engineering works and that underpinning works would permanently modify the adjacent structure's footings. He said that some "underpinning processes", such as the use of grouting under pressure or installation of piled foundations

under existing shallow footings, could themselves cause damage to buildings either immediately or by long term effect. That would be of particular concern for a building already showing evidence of poor construction. Mr Mortimer also considered that the relevant condition encompassed any method of soil stabilisation, not just traditional underpinning.

222 I do not consider that that evidence supports a conclusion that, had the Builder retained another geotechnical engineer, that engineer would have recommended grouting. More significantly, I do not consider that the evidence can support a finding that grouting would have prevented the damage about which complaint is made. This aspect of Ground 8 is not established.

223 The Owners Corporation and the Unit Owners also assert that condition D10 and the requirement "to comply with any reasonable direction by that professional engineer" embraced further Development Approval conditions not considered by the primary judge. They contend that the requirement to comply with reasonable directions of the professional engineer enlivened issues related to other conditions of the Development Approval, namely B9 and C16. Those conditions required that the excavation works were to implement the J&K Report of 13 March 2009 and that the Monitoring Plan be adopted as per that report. In light of the finding by the primary judge that a failure to install monitoring points before commencing work in accordance with the consent conditions (including the Monitoring Plan) was a failure by the Builder to take reasonable care, they allege that further findings should have been made that the Builder's failure to comply with the other consent conditions, should be considered as a breach of its duty of care, such as conducting surveys after demolition and preparing a "method statement".

224 The submissions advanced in relation to this alleged breach by the Builder raise similar issues to that raised by Ground 9. Mr Speechley's uncontradicted evidence was that he was "comfortable" with the monitoring that was ultimately put in place in regard to J&K's report and Mr Speechley raised no contemporaneous complaint with the Builder about the monitoring, notwithstanding his role. The issues related to the Monitoring Plan should fail

on the question of both breach and causation, for the reasons advanced in relation to Ground 9. This aspect of Ground 8 is not established.

225 Finally, the Owners Corporation and the Unit Owners also submitted that the primary judge erred in not determining that the Builder's failure to follow the professional advice of its own engineer, presumably Mr Speechley, was a breach of its duty. However, it is quite unclear just what advice the Builder failed to follow, especially given Mr Speechley indicated he was comfortable with the monitoring that was in place. This aspect of Ground 8 has also not been made out.

Ground 9: Failure to Execute Monitoring Plan

226 The Owners Corporation and Unit Owners assert that the Builder's failure to comply with J&K's Monitoring Plan resulted in the loss of the opportunity to mitigate or minimise damage to the Building. They say that, if the Builder had installed monitoring points prior to commencing works, and assuming that they would have shown no movement of the Retaining Wall from that period until 5 August 2010, when they were in fact installed, the 7 mm movement of the Retaining Wall recorded on 8 September 2010 would not have been dismissed as an anomaly and appropriate remedial measures would have been taken to ensure that no further movement occurred.

227 The primary judge saw no basis upon which he could conclude that, had survey monitoring been carried out in accordance with the Monitoring Plan, it was probable that the significant movement or movements of the Retaining Wall that occurred in the month prior to 8 September 2010 could not have been dismissed as an anomaly and would have been investigated by geotechnical and structural engineers, with remedial steps being taken to ensure the stability of the Retaining Wall. His Honour considered that it was a matter of speculation as to what would have been revealed had monitoring been undertaken more frequently between 5 August 2010 and 8 September 2010. His Honour observed that there was no evidence as to what steps could or would have been taken if the survey monitoring had permitted a more precise conclusion to be drawn as to when, during that period, the movement detected on 8 September 2010 took place. His Honour accepted that there was no

evidence that any departure from the Monitoring Plan caused damage to the Building.

228 In addition, the primary judge observed that Mr Speechley, who had devised the Monitoring Plan, was on site on regular occasions and agreed that he was "comfortable" with the frequency of monitoring undertaken. His Honour considered that, in view of the agreement of the Engineers that the work done on the site prior to 5 August 2010 had no effect on the Building, the absence of monitoring prior to 5 August 2010 was of no consequence. Accordingly, his Honour concluded that the Owners Corporation and the Unit Owners had not established that the failure of the Builder to implement the Monitoring Plan in fact caused any damage to the Building.

229 The absence of monitoring in the very early stages could only have had a causal effect if there were reason to believe that the movement, or significant movement, occurred in those early stages. However, there was no evidence to suggest that any movement occurred at that time. Rather, the evidence suggests the contrary. Thus, during the concurrent evidence by the Engineers, when it became clear that that the benching excavation was actually done at an angle of 35 degrees, they concluded that the benching excavation in fact had no effect on the Building. The benching excavation was based on drawings and advice from Northwood and there was no evidence that it was unreasonable to proceed on that basis.

230 The Unit Owners do not explain how the primary judge erred in failing to find that the failure adequately to implement the Monitoring Plan did not cause damage to the Building within the meaning of s 5D or s 5E of the *Civil Liability Act*, in circumstances where it was a matter of speculation as to what monitoring might have revealed. Ground 9 has not been established.

Grounds in Relation to Hughes

Ground 2: Design of the Northern Light Well

231 On 13 July 2009, Hughes wrote to the Developer submitting a fee proposal for the provision of engineering services in relation to the project on the Development Property. The proposal was based on identified architectural

drawings, a briefing document of 9 July 2009 and the Development Approval granted by the Council.

232 The fee proposal stated that the "scope for structural services"

> "included:
> design and to document the following structural elements:
> - foundations and retaining walls;
> - concept layouts for contiguous pile walls;
> - slabs on ground;
> - suspended concrete structure;
> - primary steelwork for roof and walls;
> - structural masonry;
>
> brief and liaise with geotechnical engineer;
> inspections during construction to allow certification on completion…;
> response to builders [requests for information] as needed;
> certification of compliance for [principal certifying authority] on completion."

233 The fee proposal stated that the fee included inspections for the Council to meet conditions of approval and that, unless otherwise agreed, the construction phase services proposed would be limited to:

> "review of structural steel shop drawings;
> the specified number of technical inspections during construction; and
> provision of associated inspection certificates."

234 The fee proposal from Hughes stated that the following would not be contained within the scope of work:

> "survey;
> sub-consultant services such as geotechnical engineer;
> detailed design of piling systems;
> architectural metalwork and glazing;
> roof safety anchor points …;
> builders' temporary work and shoring;
> waterproofing;
> site services search …; and
> dilapidation report for adjacent properties."

235 The Owners Corporation and the Unit Owners contend that Hughes was responsible for the structural design of the Northern Light Well and that it was negligent because it required excavation of the earth berm that was supporting the Retaining Wall and did not provide for any alternative replacement support for the Retaining Wall and the Affected Property. They asserted that Hughes breached the duty of care owed to them in that a reasonable person in the position of Hughes would not have created the design of the structural elements of the Northern Light Well, which required excavation of the berm providing support to the Retaining Wall, without taking precautions or seeking advice so as to ensure the Retaining Wall did not lose support. They say that that excavation caused movements in the foundation strata and, therefore, materially contributed to the damage to the Building.

236 The primary judge was not satisfied that Hughes did in fact prepare structural drawings from which the Northern Light Well was constructed. His Honour considered that it was more likely that the Northern Light Well was built in accordance with the instructions of Mr Walsh of Northwood. His Honour considered that that was consistent with the terms of Hughes' proposal of 13 July 2009, which excluded detailed design of piling systems from the services to be provided. It was also consistent, his Honour said, with the terms of Hughes' general structural notes, which said that the Builder was responsible for the adequacy of all temporary works, including shoring, propping and bracing and, where necessary, was to engage a structural engineer to design and certify the temporary works.[29]

237 The conclusion of the primary judge was reached after consideration of the evidence and making findings of fact based on that evidence. Thus, the position of the piles for the light wells, and a depiction of how the piles for the Shoring Wall were to be cut down, were shown on an annotation to the plans of the Architect that was provided to Pile & Bucket on 18 August 2010. Mr Patterson of Pile & Bucket said that someone from the Builder had placed two sets of five black circles on the plan to show where the piles for the light well should be placed. Mr Frigo of the Builder accepted that the Builder had told Pile & Bucket where the light well piles were to be placed. Mr Frigo

[29] Primary judgment at [403]–[404].

accepted in cross-examination that, as at 18 August 2010, when the instruction was given to Pile & Bucket, the Builder did not have in its possession any plan prepared by Hughes showing that the five piles and capping beams were to be constructed as indicated on the plan provided to Pile & Bucket. Mr Frigo was clear that it was Mr Walsh of Northwood who gave instructions and that Hughes was not giving instructions about that matter. Between 21 August 2010 and 23 August 2010, Pile & Bucket installed the five piles for each of the two light wells as depicted in the annotation on the plans of the Architect provided to it on 18 August 2010.

238 The Owners Corporation and Unit Owners focused attention on a structural drawing issued by Hughes on 30 August 2010. However, that drawing was issued after the piling work had been carried out. Mr Frigo said that, as foreman, he understood that the drawings were "basically playing catch up to identify what's been built". The cross-examination of Mr Frigo on behalf of the Owners Corporation and Unit Owners proceeded on the basis that, as at the date on which the instruction was issued to Pile & Bucket and the date on which the piling works for the light wells were carried out, Hughes had not provided any design for those light wells.

239 Further, as the primary judge held, there was no evidence of what precautions a competent engineer in the position of Hughes would have specified or of how effective such precautions would have been to prevent movement in the Retaining Wall and the Building. Even if Hughes had been responsible for the design of the piling of the Northern Light Well, his Honour was not satisfied that those activities were a breach of any duty that it owed to take reasonable care or that they were causative of any damage to the Building. Ground 2 is not established.

Ground 3: Design of the Lift Pit

240 The Owners Corporation and Unit Owners alleged that Hughes' design provided for a lift shaft adjacent to the Shoring Wall that removed support to the Shoring Wall and consequently the Retaining Wall and the Affected Property without specifying adequate precautions to provide for placement support. The primary judge concluded, however, that Hughes' design did not

provide for a lift shaft adjacent to the Shoring Wall. Rather, Hughes' original drawings, at the time of Northwood's retainer, showed the Shoring Wall stepping outside the light wells. Thus, his Honour said, according to Hughes' design, the wall of the proposed lift well was not adjacent to the proposed Shoring Wall. Rather it was Northwood's shoring design that had the effect that the Shoring Wall was to be adjacent to the wall of the lift shaft.

241 The primary judge was not satisfied that the Owners Corporation and Unit Owners had shown that it was within the scope of Hughes' duty of care to question whether Northwood's shoring design was adequate. His Honour held that Northwood had assumed responsibility for the design of the Shoring Wall and the proposed location of the lift well was determined long before Northwood altered the design of the Shoring Wall. His Honour referred to the criticism of the Northwood design in the Joint Report, in that it did not make provision for the lift pit (and also the foundation piles), the excavation of which would inevitably take place immediately adjacent to the Shoring Wall as built in accordance with Northwood's design.[30]

242 The primary judge referred to the revision to the 30 August 2010 footing plan, which Hughes issued on 8 October 2010. The details stated that the depth of the lift pit was to be to the lift manufacturer's details but did not otherwise give any indication of the depth of the lift pit. His Honour saw no reason to conclude that it was necessary for Hughes to go further or to conclude that a reasonable person in Hughes' position would have gone further. His Honour considered that there was no evidence that a competent structural engineer in the position of Hughes would have made more precise specifications than those made concerning the lift pit.

243 Further, there was no evidence as to what further precautions a competent engineer in the position of Hughes would have specified or the effect that implementation of such precautions would have had. The primary judge concluded that it was not for Hughes to adduce evidence that it was entitled to assume that Northwood's design of the Shoring Wall was sufficient to accommodate the lift pit and foundation pile excavation. It was for the Owners

[30] Primary judgment at [414].

Corporation and the Unit Owners to adduce evidence that it was not. His Honour saw no basis on which he could conclude that a reasonable person in the position of Hughes should have understood that the Northwood design had any shortcomings and would have taken precautions to compensate for that shortcoming.[31]

244 The Owners Corporation and Unit Owners contend that, although Northwood originally placed the lift pit adjacent to the Shoring Wall, it was Hughes that had ultimate responsibility for the design of the lift pit detail, including its depth. They assert that it was incumbent on Hughes to ensure that the detail contained accurate information regarding appropriate excavation levels or specified that additional support would be required. They say that Hughes did not do so and the lift pit was excavated below RL6.6m. They rely on the fact that the Engineers agreed that that caused movements in the foundation strata and therefore contributed materially to the damage to the Building.

245 Mr John Alden, who was called to give evidence by Hughes, expressed the opinion that normal industry practice was that the dimensional layout of the Building, including the location of the lift shaft, was a requirement of the architectural design for the Building. He said that it was necessary for the designer of the shoring system to take into account the requirements of the Architect for the location and layout of the lift shaft as an input to the shoring design process and not the other way round. Hence, he said, any problems relating to the excavation levels for the lift represented deficiencies in the design of the shoring system.

246 Hughes contends that, in terms of the excavation of the area of the lift pit, the criticisms that were made by the Engineers in the Joint Report were directed at the inadequacies of Northwood's design and not the design work of Hughes. The Engineers agreed in the Joint Report that the additional excavation depth over the general excavation level at the lift pit and pile caps north of the lift pit was a factor that caused the movement of the Shoring Wall. They considered that factor to be an element of the inadequate design prepared by Northwood and stated in the Joint Report that the Northwood design, including the pile

[31] Primary judgment at [407]–[423].

depths, should have incorporated accurate information on the site excavations, lift pits, et cetera.

247 In cross-examination, Mr Alden said that the Northwood design did not show the design excavation depth but simply showed a basement floor slab level of 6.75 m and the piles at a toe depth of 3.3 m at a fixed distance below that level. He said that the required excavation depth was the primary input to the shoring design.

248 The primary judge accepted that Mr Alden's explanation of the Joint Report position of the Engineers that had been reached during their conclave was consistent with the opinions he had expressed in his reports. For example in a report of 7 April 2016, Mr Alden was critical of the Northwood design drawings in the form they were issued for consideration on 19 August 2010, for not showing, or not correctly showing, the required depth of the piles at the lift pit and the excavation level on which the shoring design was based. He expressed the opinion in his report that, as the piling embedment depth below the base of any excavation is a critical design parameter, he would have expected the Northwood drawings to have shown clearly the excavation level that the design was based on and the minimum permissible pile embedment depth at the critical stage when excavation had reached the maximum depth.

249 The primary judge correctly concluded that any problems associated with the excavation of the lift pit arose from the inadequacies of Northwood's design for the Shoring Wall and not from any design work undertaken by Hughes. Ground 3 has not been established.

Ground 5: Design (Location) of the Basement Level Foundation Piles

250 The Owners Corporation and Unit Owners alleged that Hughes' design provided for excavation works for the foundation piles on the Development Property without regard to Northwood's design of the Shoring Wall and the location of the Shoring Props. They asserted that Hughes remained responsible for columns, footings and ground floor structure affected by Northwood's cost-saving measures. After Northwood provided its final shoring design, Hughes then finalised its design of the basement foundation piles.

251 The primary judge was satisfied that the need to remove and replace the props was a product of Northwood's design. His Honour considered that that was significant because all of the engineers agreed that the removal and replacement of props was a significant cause of the movement in the Shoring Wall and thus of the Retaining Wall and the foundations under the Building. His Honour observed that that occurred very shortly before the significant movement detected on 8 November 2010.

252 His Honour accepted that Hughes' design may not have adverted in terms to the location of the props. However, his Honour did not see why it should have done so. Further, his Honour did not see how it could be said that Hughes' design had any connection with, let alone caused, the replacement and removal of the props to the Shoring Wall. The replacement and removal of the props were primarily caused by the failure of Northwood, through Mr Walsh, to heed Mr Paterson's requirements concerning access to the area below the props.[32]

253 The Owners Corporation and the Unit Owners contended that Hughes' design was negligent because the excavation of the foundation piles that it designed required removal of the steel props (the Shoring Props) that were contained in Northwood's existing shoring design. They rely on the agreement on the part of the Engineers that removal of the steel props caused movements in the foundation strata and therefore materially contributed to the damage to the Building.

254 Mr Alden expressed the opinion, in relation to excavations, that a system of shoring is typically a structural system that restrains the faces of the excavation so as to prevent collapse and to protect property and people adjacent to and within the site of the proposed development. He explained in oral evidence that the common position reached by the Engineers, as stated in the Joint Report, was that Northwood's design failed to incorporate accurate information about the site excavations that the shoring system was required to accommodate. Mr Alden said it was necessary for Northwood to establish the depths of excavation necessary to construct the proposed building on the Development

[32] Primary judgment at [218], [438]–[441].

Property because that was a key input parameter for the design of the shoring system. He said that Northwood failed to do so.

255 Hughes contends that, in respect of the structural design of the foundation piles that were located to the north of the lift well and adjacent to the Shoring Wall, Northwood, as the designer of the Shoring Wall, was required to have regard to, and accommodate, the necessity to build those foundation piles and caps. On 26 February 2010, Mr Walsh, on behalf of Northwood, wrote to the Developer and acknowledged that he had been provided with a footing drawing prepared by Hughes that depicted foundation piles on the very locations about which the Owners Corporation and Unit Owners now complain.

256 The Owners Corporation and Unit Owners contend that the uncontradicted and compelling evidence below was all to the effect that it was the responsibility of Hughes to review Northwood's shoring designs to ensure that they were not in conflict with the requirements of the piling contractor. Hughes asserts that that contention is not an accurate statement of the state of the evidence or of the manner in which the hearing was conducted. Thus, it says, it was not alleged against Hughes that it was required to review Northwood's design of the Shoring Wall to ensure that it was not in conflict with the piling contractor's requirements for convenient access to the site to carry out the piling works.

257 Hughes contends that the Owners Corporation and Unit Owners opened their case before the primary judge on the basis that the necessity to remove and replace the props that supported the Shoring Wall, which the Engineers agreed was a significant cause of the movement in the Shoring Wall, arose solely from Northwood's design. His Honour accepted the evidence of the piling contractor that it had raised concerns with Mr Walsh that the spacing between the props was insufficient to allow the piling rig to gain access to parts of the site but that Mr Walsh had insisted that the props be placed in accordance with Northwood's design. That, in turn, necessitated the removal and replacement of the props to allow the piling work to proceed. There has been no challenge to those findings. There is no substance in Ground 5.

Ground 6: Failure by Hughes to Take Action

258 The Owners Corporation and the Unit Owners asserted that Hughes was negligent in failing to take appropriate action when informed of reports of cracking in the Building on 11 October 2010. They contended that Hughes was aware or ought to have been aware that the survey monitoring had recorded a 7 mm movement between 5 August 2010 and 8 September 2010 and that a reasonable person in the position of Hughes would have investigated the complaints and, on substantiating the cracking, would have commenced an investigation of potential causes of the movement revealed by the survey monitoring. They asserted that, given the speed with which movement issues were resolved in November 2010, there was a strong probability that temporary shoring would have been recommended for the Retaining Wall or the Shoring Wall, which would have prevented the further damage.

259 The primary judge concluded that there was no evidence that Hughes knew of the monitoring results recorded on 8 September 2010. His Honour saw no reason why Hughes should itself have initiated an investigation into the reported cracking. The Architect did not ask Hughes to do anything other than to send the dilapidation reports to the Builder, which it did.

260 The email from the Architect to Hughes of 11 October 2010 saying that the Builder was encountering some neighbour concerns with regard to cracking and asking for the dilapidation reports was consistent with Hughes having no involvement in the shoring issues or with the concerns raised by neighbours that were being addressed by other parties. There is no substance in Ground 6.

Ground 11: Causation Generally

261 The primary judge found that there was no evidence linking the 7 mm movement detected between 5 August 2018 and 8 September 2010 to any shortcoming in the Temporary Retaining Propping. His Honour referred to the agreement on the part of the Engineers that, because of the sandy nature of the subsoil under the Development Property and under the Building, the underground impact of any activity on the Affected Property would be

immediate and once off and would occur almost instantaneously.[33] His Honour considered that if, as the Owners Corporation and Unit Owners contended in their case against the Builder, cracking in the Building attributable to the Shoring Works first occurred during October 2010, it suffered damage and loss then. His Honour considered that there was no evidence enabling him to reach any conclusion as to what further damage occurred by reason of later events, including the lift excavation.[34]

262 Similarly, in relation to Hughes, the primary judge considered that there was, in any event, a question of what further damage could be said to have been caused to the Building by the lift pit excavation, which occurred on 29 October 2010.[35] His Honour held that, by the time of the excavation for the foundation piles on 4 November 2010 and 6 November 2010, movement of the foundations under the Building had already occurred. His Honour considered that there was no evidence enabling him to determine what further loss occurred as a result of any further movement attributable to the foundation excavation.[36]

263 The Owners Corporation and the Unit Owners assert that they have discharged their onus in respect of proving factual causation by establishing that the relevant negligence materially contributed to the movement of the foundation strata, a movement that was agreed by the Engineers to be the cause of damage to the Building. Thus, they say, but for the movement, the Building would not have been damaged. They say that the evidence of the Engineers demonstrates that to be the case.

264 Further, the Owners Corporation and the Unit Owners say, damage to the Building caused by the collapse of foundation strata was clearly an occurrence of such a kind that does not ordinarily occur without negligence and therefore of a kind to which the doctrine of *res ipsa loquitur* attaches. They contend that, if the Court considers that the precise cause of the damage to the Building is not revealed by the evidence, the Court should infer that it was caused by

[33] Primary judgment at [369].
[34] Primary judgment at [390].
[35] Primary judgment at [424].
[36] Primary judgment at [433].

excavation, arising out of either negligence on the part of the Builder or the result of engineering negligence.

265 The Builder contends that the primary judge set out the relevant principles as to the legal test of causation in an orthodox manner, correctly identified the relevant principles and applied them correctly to the factual matrix.

266 In response to the asserted application of the principle *res ipsa loquitur*, the Builder complains that the contentions advanced on behalf of the Owners Corporation and the Unit Owners failed to address the requirement that reliance on the doctrine should have been clear from the pleadings and it was not. Secondly, the Builder says, the contention failed to explain how the doctrine is to be applied in the context of the *Civil Liability Act.* The Builder says that the primary judge was correct in not considering a contention that involved a considerable amendment to the case advanced by the Owners Corporation and the Unit Owners without pleading it.

267 The Builder says that, in accordance with s 5D of the *Civil Liability Act,* the starting point for any inquiry in relation to causation is to determine what breaches of duty are established and then consider whether that breach was a necessary condition of the occurrence of the harm. Further, s 5E of the *Civil Liability Act* makes clear that the plaintiff always bears the onus of proving, on the balance of probabilities, any fact relevant to the issue of causation. The Builder asserts that, ultimately, the only breach of duty found by the primary judge in relation to the Builder was the failure to implement fully the site monitoring programme. The Builder says that his Honour was correct in finding that that breach was not causative of the harm occasioned to the Building.

268 The Owners Corporation and the Unit Owners contend that the primary judge was in error in embarking upon a search for a precise scientific linking of discrete individual acts or omissions on the Development Property during the construction works to discrete individual movements of soils or loss of soils. The Builder contends that the primary judge's approach was orthodox and encapsulated in the finding that the critical question was whether it was a failure to exercise reasonable care by the Builder or Hughes that caused the movement of the foundations under the Building. The Builder says that, given

the findings by the primary judge that, in effect, all of the elements that caused movement identified by the Engineers were ultimately the responsibility of Northwood, it is not surprising that the Owners Corporation and Unit Owners failed to establish causation.

269 Hughes contends that, on the question of causation, the primary judge adopted an orthodox approach and proceeded on the basis that it was for the Owners Corporation and Unit Owners to show that any breach of duty by Hughes caused them to suffer damage. Hughes also pointed to s 5E of the *Civil Liability Act* requiring the plaintiffs to prove any fact relevant to the issue of causation on the balance of probabilities.

270 Hughes relies on the fact that the primary judge did not find any breach of duty by Hughes. In respect of the Northern Light Well, his Honour held that, even if contrary to his findings Hughes was responsible for the piling of the Northern Light Well and the subsequent excavation, his Honour was not satisfied that those activities constituted a breach of the duty owed by Hughes or, in the light of the opinion evidence, was causative of any damage.

271 Hughes also complains that the principle of *res ipsa loquitur* was not pleaded and was raised for the first time in closing submissions. Even if the principle applies in the context of the *Civil Liability Act*, Hughes complains that the Owners Corporation and the Unit Owners do not address the bases upon which they contend that the primary judge ought to have made such a finding.

272 In their written reply, the Owners Corporation and the Unit Owners accepted that causation was to be determined by reference to s 5D of the *Civil Liability Act*, which relevantly provides that they must establish that any breaches by the Builder and Hughes were necessary conditions of the harm suffered, namely damage to the Building. The Engineers agreed unanimously that the damage to the Building was caused by movement in the foundation strata. That, they contended, raises the strong suggestion that anyone who was responsible for such movement was liable.

273 The Engineers also agreed unanimously that the movement in the foundation strata was caused by a combination of the movements of the Retaining Wall and the Shoring Wall and that inadequate temporary popping of the Retaining

Wall, inadequate design and over-excavation below RL6.6 m were all factors that caused movement in the Retaining Wall or Shoring Wall. The Owners Corporation and the Unit Owners contend that the overall movement that caused the damage to the Building was thus the cumulative effect of those individual acts of negligence which, they say, will satisfy s 5D(1)(a), namely, negligent acts or omissions that are necessary to complete a set of conditions that are jointly sufficient to account for the occurrence of the harm. They contend that each of the negligent acts materially contributed to the damage suffered by them.[37]

274 The Builder complains that the case was never put in that manner by the Owners Corporation and the Unit Owners. It is certainly not pleaded as such. However, the Owners Corporation and the Unit Owners say, the opening submissions advanced on their behalf were to the effect that the Engineers agreed that the movement of the Retaining Wall was the result of a combination of several factors, including movement of the Shoring Wall and inadequate temporary propping of the Retaining Wall. The Builder asserts, on the other hand, that that submission was based on a misunderstanding as to the state of the evidence in relation to propping. The Builder says that that is not the same as the submission now pressed, namely, that the overall movement that caused the damage to the Building was the cumulative effect of individual acts of negligence. Rather, the Builder says, the submission just referred to was that the movement was the result of a combination of several factors, including movement of the Shoring Wall and inadequate temporary propping of the Retaining Wall. The Builder says that that is different from what is now being alleged. It does not assert that any negligent act of the Builder increased the risk of the overall movement that caused the damage to the Building.

275 Having regard to the conclusions reached above, that the only breach that occurred was on the part of the Builder in relation to the excavation on 20 August 2010, the question of the cumulative effect of successive breaches does not arise.

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[37] See Strong v Woolworths Limited (2012) 246 CLR 182 at 191–192; [2012] HCA 5 at [20] (French CJ, Gummow, Crennan and Bell JJ).

276 Further, having regard to the conclusion reached in relation to Ground 1, it is unnecessary to consider further the contentions advanced on behalf of the Owners Corporation and the Unit Owners based on the principle *res ipsa loquitur*. That is to say, the primary judge ought to have found that the excavation carried out on 20 August 2010 had a relevant causal connection with the damage to the Building.

Conclusion

277 It follows from the above that the appeal should be allowed in part, in so far as the primary judge dismissed the claim as against the Builder. However, it will be necessary to hear further argument in relation to the Builder's defence based on the proportionate liability provisions of the *Civil Liability Act.*

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APPENDIX 1

Figure A: The Architect's Plan for the New Apartment Building

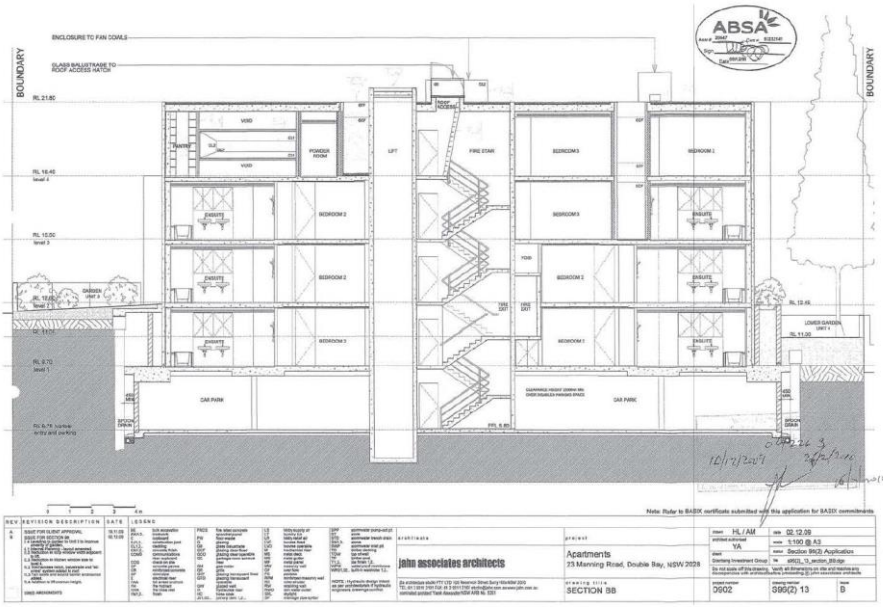

Figure B: Hughes' Shoring Layout Plan – Issued Late 2009

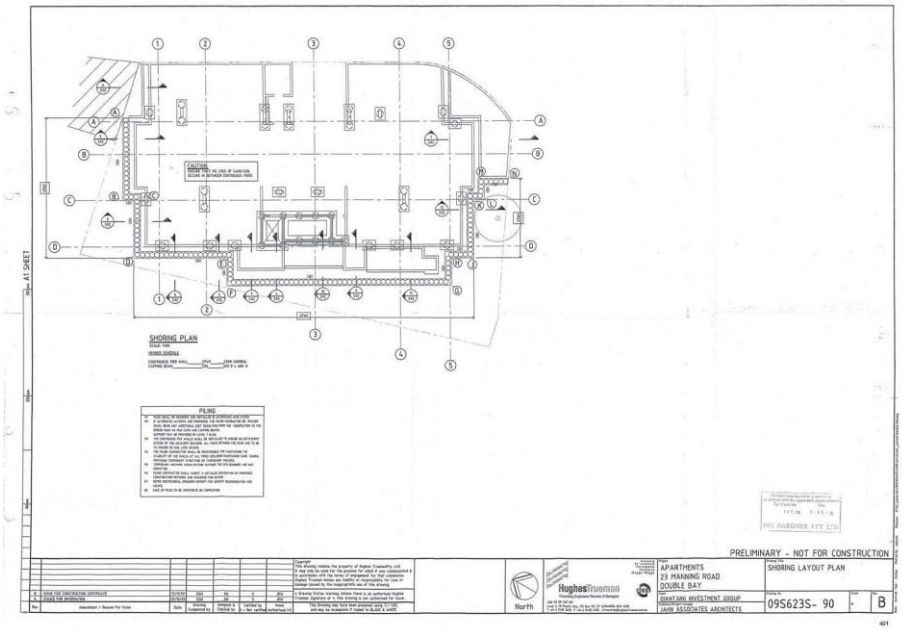

Figure C: Northwood's Design – Level 0 – Shoring Wall with Straight Western Section, Shoring Props and Lateral Loading Piles with Capping Beams

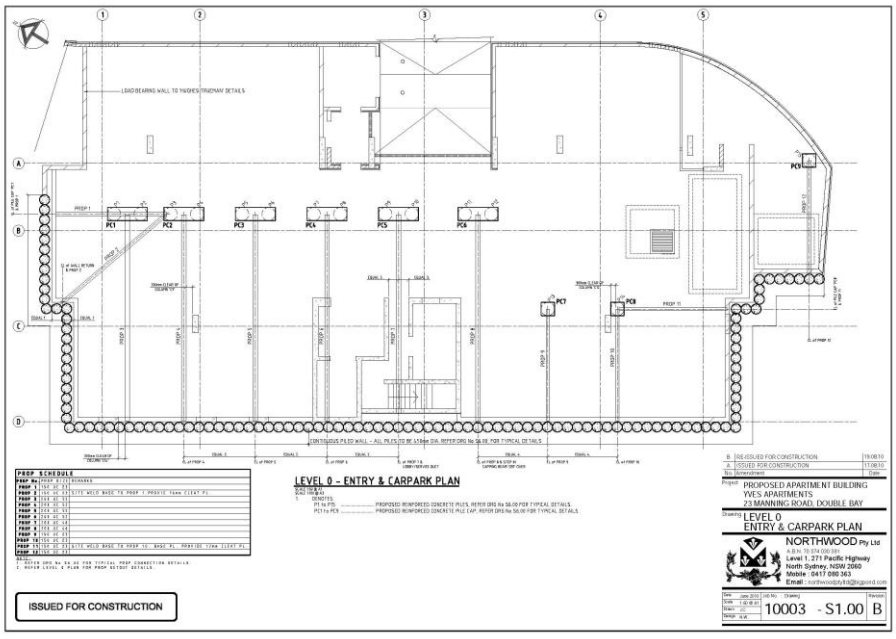

Figure D: Photograph of 6 October 2010 Looking North Over Shoring Props Against Capping Beam of Shoring Wall – Sand Berm Visible Below Props

Figure E: Northwood Butter Paper Sketch 1

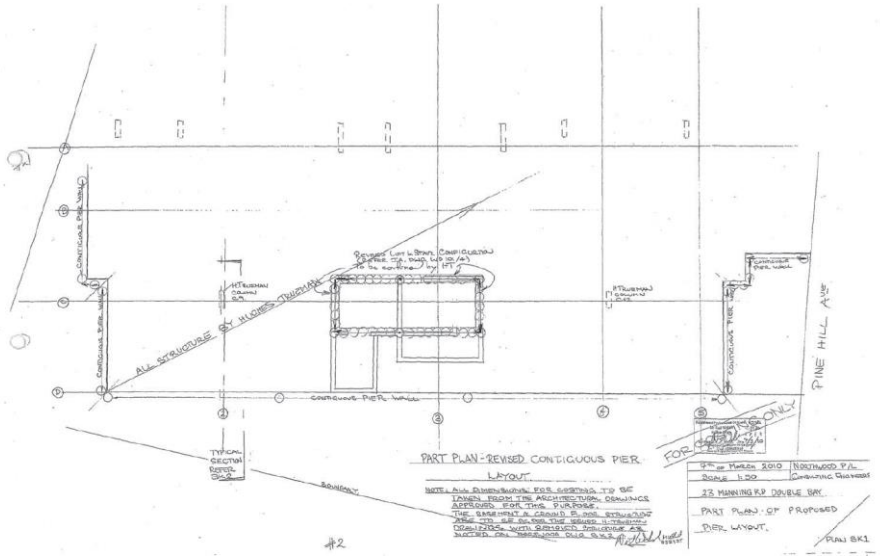

Figure F: Northwood Butter Paper Sketch 2

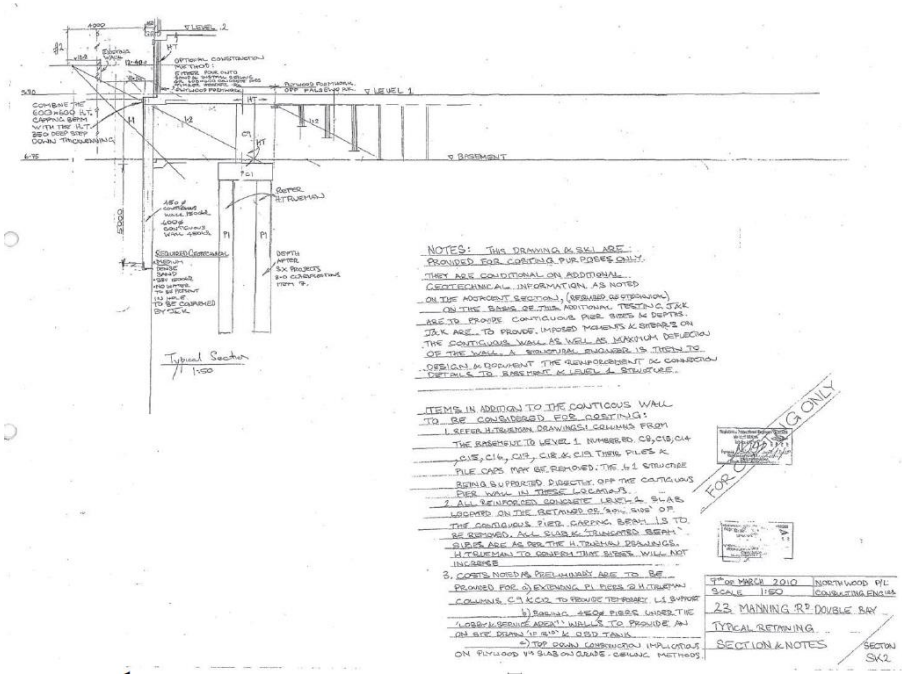

Figure G: Architect's Construction Plan for Level 1 – Incorporating Northwood's Proposed Straight Shoring Wall

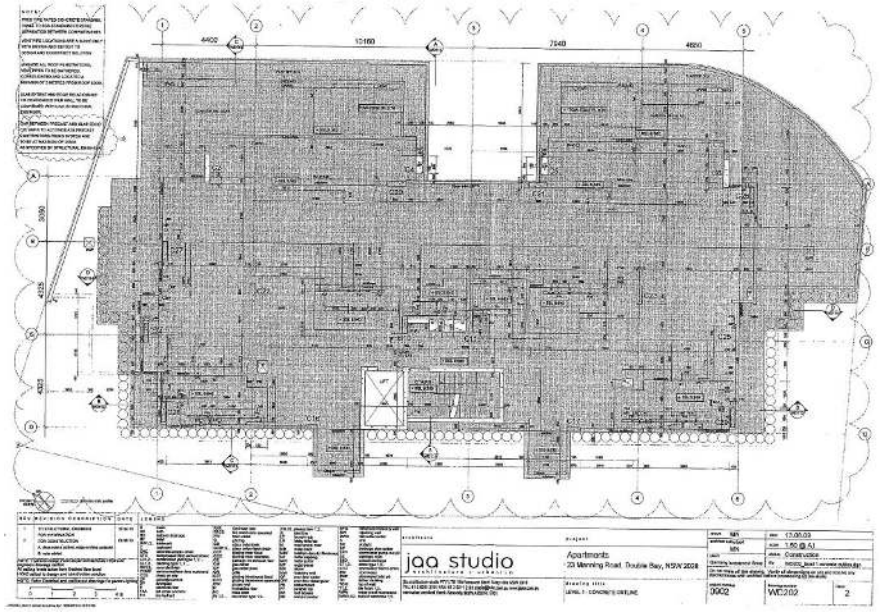

Figure H: Detail of the Architect's Drawings with New Piles Indicated Around the Light Wells Marked in Black

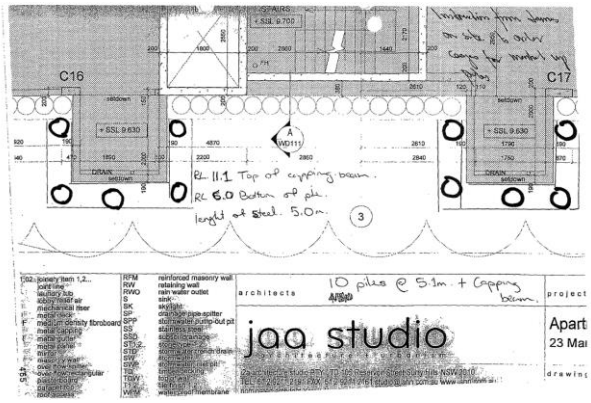

Figure I: Western Elevation – Northwood Plan

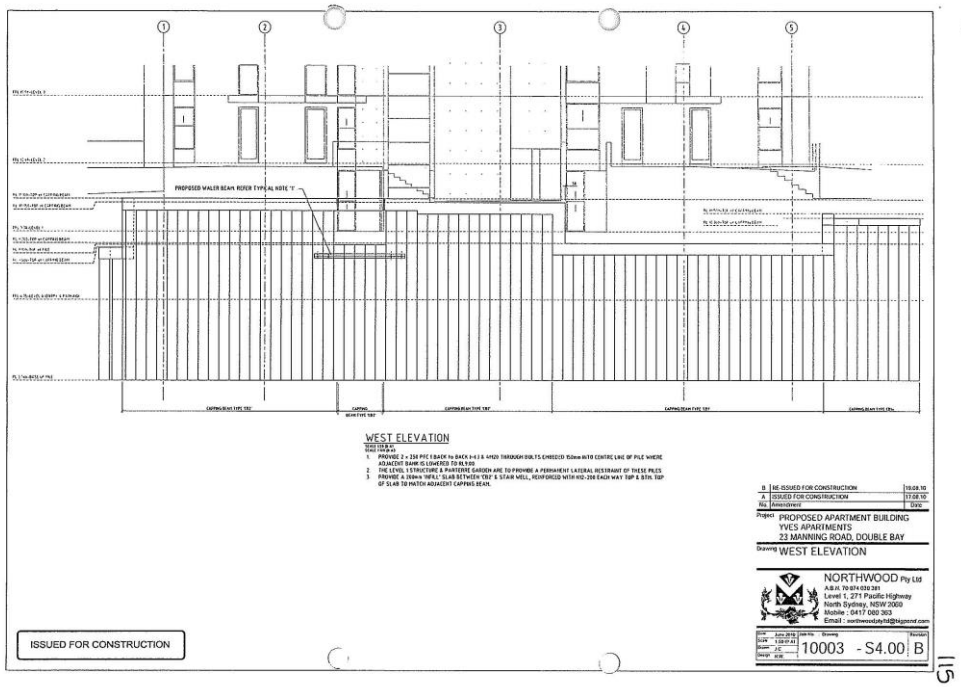

Figure J: Waler Beam Visible Following Excavation to Level 0 with Foundation Piles Visible Below Shoring Props

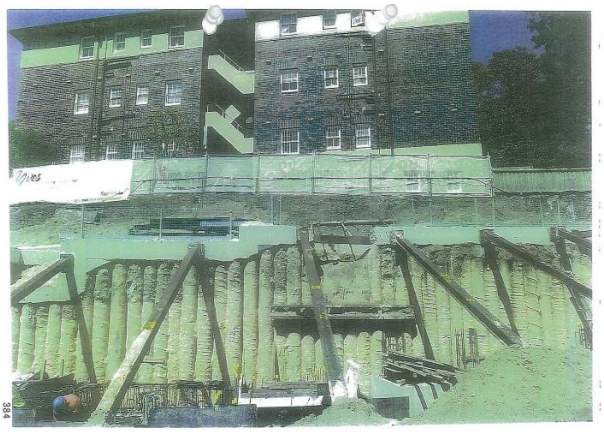

Figure K: Northwood Sketches for Temporary Removal of Shoring Props

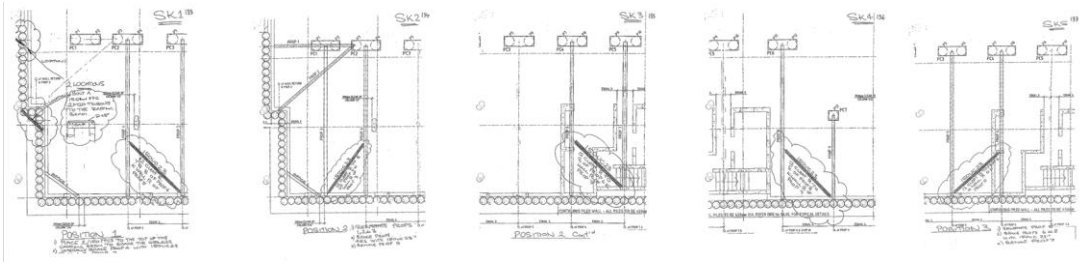

Figure L: Undated Photograph of Lift Shaft Excavation in Front of Waler Beam