VICTORIAN CIVIL AND ADMINISTRATIVE TRIBUNAL

CIVIL DIVISION

VCAT REFERENCE NO. D1239/2013

BUILDING AND PROPERTY LIST

CATCHWORDS

Building - *Domestic Building Contracts Act* 1995 – s.8 warranties – waffle raft slab – deformation of slab – consequential damage – likely cause of deformation – AS2870-1996 – application of – Class "H" site – soil highly reactive – method of construction of waffle raft slab – importance of drainage – manner of rectification – liability of builder

APPLICANT	Ms Annette Watson
RESPONDENT	Richwall Pty Ltd (ACN:060 578 716)
JOINED PARTY	McFarlane and Partners Pty Ltd (ACN: 006 500 152)
WHERE HELD	Melbourne
BEFORE	Senior Member R. Walker
HEARING TYPE	Hearing
DATE OF HEARING	11-15, 19 and 22 May 2015
DATE OF ORDER	5 August 2015
CITATION	Watson v Richwall Pty Ltd (Building and Property) [2015] VCAT 1191

ORDER

1. Order the Respondent to pay to the Applicant $62,066.67.
2. Costs reserved

SENIOR MEMBER R. WALKER

APPEARANCES:

For the Applicant	Mr R. Scheid of Counsel
For the Respondent	Mr P. Lithgow of Counsel
For the Joined Party	No appearance

REASONS

Background

1 The Applicant ("the Owner") is the owner of a house ("the House") in West Melton.

2 The First Respondent ("the Builder") is and was at all material times carrying on business as a builder.

3 By a building contract dated 7 July 2007 ("the Contract") the Builder agreed to construct the House for the Owner for a price of $224,650.00. The construction was to be in accordance with architectural plans, engineering designs and specifications which formed part of the Contract.

4 Construction of the House appears to have commenced in early August 2007 because on 14 August 2007 the Builder invoiced the Owner for the base stage payment as well as the deposit.

5 The frame stage was invoiced on 23 August, lock up payment was invoiced on 8 September and the fixing stage payment was invoiced on 8 October.

6 Possession of the completed House was given on 6 December 2007.

Complaints

7 According to the Owner's evidence, about 3 months after moving in she noticed cracks in the House in the lounge room and the front bedroom.

8 Thereafter, further cracks appeared in the en suite and in the kitchen, particularly adjacent to the bulkhead over the cook top and stove and also along the family room wall.

9 She reported the cracking to the Builder and repairs were carried out by the Builder in April 2009.

10 Despite these repairs, and other repairs carried out afterwards from time to time by the Builder, the cracking became worse. The Owner also noticed that, during periods of high wind a creaking noise could be heard coming from the roof space.

11 When the Builder refused to carry out any further rectification work, these proceedings were commenced in November 2013.

The Hearing

12 The matter came before me for hearing on 11 May 2015 with 10 days allocated. Mr R. Scheid of Counsel appeared for the Owner and Mr P. Lithgow of Counsel appeared for the Builder. By that time the Joined Party had been removed from the proceeding.

13 I heard evidence from the Owner, her engineer, Mr McLaren, and a building expert, Mr Love.

14 For the Builder I heard from its director, Mr Gargan, from the site supervisor, Mr Wright, from a geoscientist, Dr Dalhaus from an engineer, Dr Baigent and from the Builder's plumber, Mr Edwards.

15 On Tuesday, the second day of the hearing, I visited the House in company with the parties and the Owner's experts, Mr McLaren and Mr Love. I then accompanied the parties to a reserve approximately 1.6 kilometres away to view the nature of the geology in the area.

16 The hearing resumed on the Wednesday and continued until the Friday. There was a lay day on the Monday 18 May and evidence was completed on Tuesday 19 May. I heard submissions from Counsel on Friday 22 May following which I said I would provide a written decision.

The issues

17 The main issue in the case is to do with the movement of the slab upon which the House has been constructed. It is what is known as a waffle pod raft slab and it was designed by the Joined Party.

18 Levels of the slab were taken by Mr McLaren and since no other levels have been taken I accept their accuracy. They do not appear to be dispute.

19 The House is on the south side of the road and so faces north. The lowest point of the slab, which is on the west side, halfway between the front and the back of the House was taken as the base point and all other levels are relative to that. There is an alfresco area at this base point and the expert opinion is that the slab has probably subsided there.

20 Relative to the base point, the north east corner of the slab is 66mm higher. That is the highest point.

21 The unevenness however is not an even fall between those two points. There is another noticeable heave approximately half way along the back wall of the House where an articulation joint has separated and the floor has risen relative to the base point by over 30 mm. There is also a point near the rear of the garage where the floor appears to have risen relative to the base point by over 40 mm. These differences are considered to be largely due to the slab rising but also, to some deghree, to the slab settling at the base point.

22 Mr McLaren measured the differential footing movement from the north east corner to the south west corner as being 35mm. This calculation is made by averaging the levels of the two corners and deducting the measured height of the slab at the mid point between those two points.

23 The questions to be determined are, why has the slab deformed in the way it has and is that attributable to any poor workmanship on the part of the Builder?

24 There are also other building defect issues raised, some related to the slab and some not.

Item 1. - The slab movement

25 Most of the damage complained of relates to movement in the slab which in turn has caused movement and consequential damage to the fabric of the House, particularly the walls, ceiling and plasterwork. The extent of the cracking, which has already been repaired more than once by the Builder, is quite severe.

26 I accept Mr Lithgow's submission that it is insufficient simply to prove damage. The damage complained of must be shown to be due to the breaches of the contract that are alleged. The onus is upon the Owner to show that that the movement is the result of the Builder's faulty workmanship.

27 According to Mr McLaren, the plans show that the site was to be excavated for the purpose of constructing the slab. Before construction began, the land upon which the House was to be built sloped from a high point in the north east corner of the block down to a low point on the south west corner. Mr McLaren said that this would have required the Builder to excavate to a depth of approximately 615mm below ground level at the north east corner. He said that any excavation of a site deeper than 500mm requires the site to be reclassified and he was not aware whether that had ever been done.

Soil classification

28 The classification of the site by the geotechnical engineer was class "H" and the preponderance of expert opinion seems to be that that was an appropriate classification given the findings in the bore logs that the soil engineer found. It is common ground that an "H" classification indicates that the soil is highly reactive.

29 Mr McLaren took four samples of the soil at different levels from a bore log that he excavated on the site and, after calculating what is known as the Ys of the soil, he arrived at a figure of 71 for which, he said, an H classification was appropriate. He said that, where the excavation occurred, the Ys reduced because there was less reactive clay between the base of the cut and the underlying basalt. He recalculated the Ys at the base of the site cut and arrived at a figure of 53.

30 Dr Baigent said that, because Mr McLaren had obtained a YS result over 70 that meant that the design in the Australian Standard regulating the construction of slabs, which is AS2870-1996, could not be used and that he (Dr Baigent) would have classified the site as an H2 or an E. I accept Mr Scheid's submission that, in accordance with the expert evidence, the reading has to be rounded to the nearest 5 which makes the figure 70 which is the maximum figure for an H classification. I am satisfied that the soil classification was correct.

31 The evidence does not establish that DM Lawrence was wrong in the classification of the site has an H class site, nor that the slab design by McFarlane and Partners was at all deficient. Indeed, Dr Baigent said that

the design was in accordance with AS2870-1996. That does not appear to be disputed and I accept that evidence.

32 A soil expert who has done extensive work in mapping the soils in the area, Dr Dalhaus, was called on behalf of the Builder. He gave evidence that the area is a short distance from an area known as the Gilgai plain. The soil in that area has peculiar qualities in terms of movement. Although he appeared to acknowledge that the site in question was not on the Gilgai plain he said that he would nonetheless have classified it as H2 or P under the 1996 version of AS2870.

33 In his report of 6 March 2015, Dr Dalhaus identified the question he had been asked as being, whether the damage suffered by the House was inevitable, given the expansive nature of the soil? He then described at length the investigative work that he has done in the area over the years. Although he acknowledged that the soil mosaic features in the area of the Applicant's property are more subtle when compared with those of the Melton Gilgai Woodlands Conservation Reserve, which was the area visited during the hearing, he said that the process of their development was similar.

34 In his conclusion, Dr Dalhaus said that the site of the House is underlain by expansive soils subject to deep seated movements, that these expansive soils constitute a geohazard that must be considered in the context of landscape, rather than the individual property and that the prescribed standard, AS2870/2011 does not take sufficient account of the expansive soil geohazard as a whole of landscape feature.

35 Mr McLaren said that the soil upon which the House was built was not Gilgai soil but was found to be on weathered basalt.

36 Dr Baigent referred to the references in the soil report to the possibility of movement experienced on an H-class site and said that, with a Ys of between 40mm and 70mm the site can experience high ground movement from change in soil moisture. He said that the design contemplated that there will be "inevitable differential movement at the footing structure" which will result in cracking. He said that minor cracking in Category 1 and Category 2 and, rarely, in Category 3, is to be expected.

37 Although a report was prepared by Mr C,E. Lawrence on behalf of the Builder he was not called to give evidence. His report is in the Tribunal Book and Mr Scheid referred me to paragraph 3.1 of the report, where Mr Lawrence said:

> "Following a review of the site plan (see below) it can be seen that the site has been cut up to 700mm to form the level platform for the waffle slab. The slab plan has requested that following construction of the slab the ground be graded away from the slab edge. A site drainage plan does not appear to have been completed; however, it is common practice to provide either a A/G drain or spoon drain at the base of all site cuts to

enable the ground to be sloped away from the building in accordance with the engineer's design."

"The history of the distress is important in determining the cause. It first appeared in the north east corner of the house soon after the owner's moved in. This timing would tend to suggest that water ponded against the slab in the north east corner. The levels clearly show the magnitude of this heave".

Construction requirements

38 Mr Scheid referred me to the drainage requirements of AS2870-1996 (Clause 5.5.3) and to the notes on the Engineer's drawings, which state (inert alia):

"Grade ground surface to give min. 1 in 60 fall away from the building for a minimum distance of 1200mm";

and

"Surface grading or drainage shall be provided around the permitter of the building so that no water can pond or collect adjacent to the slab/footing. The drainage measures shall be carried out prior to or immediately after construction of the slab/footing"

39 Reference was also made by Mr Scheid to an earlier draft floor plan prepared by the Builder's designer that contains notations as to drainage requirements, including the need for a spoon drain, but I agree with Mr Lithgow that that was not a contractual document and so has no binding force.

40 Mr McLaren pointed out that the major heave is in the north east corner, which is where the greatest excavation occurred. He said that it was essential for the Builder to be careful about drainage of the site both before and during construction. He said that there ought to have been a spoon drain constructed in the north east corner to take any water away so that it would not pond in the reactive soils adjacent to the footprint where the slab was to be poured.

41 He referred to a number of photographs that were taken by the Owner during construction which were in evidence. He said that it did not appear from these photographs that any such spoon drain had been constructed. He said that the effect of failing to put in proper drainage is that water will pond next to the footprint of the slab, soak into the soil and cause heave.

42 Mr Love said that there should have been sealed clay installed around the edge of the footprint in a way that falls away from the foundations. He said that he would not call the soil that was placed around the House compacted clay. He said that it was important that the soil under the slab have a consistent moisture content and that seems to be the weight of the professional opinion.

43 Mr Wright, who supervised the construction, did not appear to be aware of the need for site drainage and acknowledged there was no spoon drain shown in the photographs nor any agricultural drain.

44 Mr Gargan accepted there should have been a spoon drain and says that they would have created one but it does not appear in the photographs. He said that the Builder graded the clay away from the footprint but since he did not visit the site except perhaps on a couple of occasions, as to which he appeared to have no specific recollection, I do not see how he could give that evidence. In any case, it was inconsistent with the evidence of Mr Wright and is not supported by the photographs.

Cause of the heave

45 Mr McLaren concluded that the heave was due to poor drainage around the outside of the building. In his report, he said that this was due to the lack of an effective drainage system in place during construction by the Builder and to the inappropriate landscaping undertaken by the Owner.

46 As to the former, he criticized the construction process in the following respects:

(a) the fact that the footings were left exposed during construction with no provision apparent in any of the photographs for the water to be directed away from them;

(b) that no temporary downpipes were installed by the Builder during construction, so the water from the front of the roof on the eastern side would be directed out of a pop in the gutter directly onto the ground adjacent to the place where the maximum heave has occurred. (Mr Lithgow suggested that it would have been a very short time without a downpipe but it is not possible to say how long it was);

(c) the failure of the Builder to construct adequate drainage to the site before and during construction and then backfilling around the edge beam with porous material allowing water to reach the soil under the edge beam.

47 As to the latter he said that it was the duty of the Owner to maintain the drainage system installed by the Builder but said that she was provided with a flat site with no drainage system in place and the landscaping that she did consisted of providing trafficable surfaces on top of the surface left by the Builder.

48 He attributed the substantial heave in the north east corner to a wetting of the soil and the apparent drop next to the alfresco area due to the fact that it was a covered area protected from the weather and covered with a timber deck with open boards, allowing the soil to dry.

49 He said that the damage experienced, when related to Appendix C in AS 2870, was in Category 2.

50 He acknowledged that there had been significant change in the land from farmland to urban and that there had been a long drought up to the time the House was constructed. However it appears from the rainfall data that is in evidence that the drought did not break until halfway through 2010. Mr McLaren said that he thought that the drought was not a contributing factor.

51 The Owner had constructed the driveway, the path at the front of the House and some external paving. The heave was not consistent around the perimeter of the House. It was put to Mr McLaren that she was partly responsible for any irregularity in moisture content but he pointed out that that the concrete on the patio her tradesman constructed sloped away from the House.

52 Mr Edwards said that he was called to the site sometime after construction to look at the grey water pump which had failed. He said that the east side of the House was wet and he attributed this to the grey water system. However as the site visit showed, the grey water system discharges some distance towards the back of the site and a long way from the areas experiencing the heave. I am not satisfied that this provides any explanation for the heave.

53 Mr Scheid suggested that the sewer pipes under the House might be leaking but there was no evidence to that effect. It was conceded that there was an absence of flexible pipe joins in the sewer pipes but despite some testing no breaks have been found. I cannot find that leaking pipes provide any explanation either.

54 It was alleged by the Builder that the landscaping by the Owner in the front yard might have contributed to any moisture problems in the front of the house. However the concrete slab already mentioned, which slopes away from the House, separates the garden from the House and there is no garden bed against the north east corner which is where the biggest heave has occurred.

55 In re-examination Mr McLaren was asked about the quantity of water that would have been directed out of the pop over the north east corner of the House during construction. He said that for one of the days of rainfall shown in the chart he calculated that it would have been 340 litres which he said was a significant amount of water to be taken up by the soil under the north east corner of the House. He said that a waffle pod slab should be built on a high spot and instead it is often put in a hole.

56 Dr Baigent said that in his opinion almost all of the cracking would be in either Category 1 or Category 2. He acknowledged that the floor movement in the front bedroom was “possibly greater than Category 3” but he said that he believed that was related to poor drainage conditions and not to any deficiency in the design.

57 He said that, if the footing had been affected by poor drainage during construction, this would not still be manifested this long after construction

ceased. He said that the backfilling of the area around the slab during construction would have had no influence on the movements that have now occurred. He said that, while it may have minimized the initial differential movement of the slab, it is the differential ground cover combined with the effect of the highly reactive clay soils that are the cause of the current damage. He said that the damage was "exacerbated by the present of garden beds, lawn and gravel areas along with concrete pavements around the perimeter of the dwelling." He concluded that in his opinion none of the damage was as a result of defective construction.

What to make of this evidence

58 I think all of this evidence can be reconciled. The garden beds, concrete paths and gravel have been placed by the Owner on the uncompacted fill that the Builder placed around the edge beam during construction. Mr McLaren's criticism relates to the site cut, which is the layer that lies below that uncompacted fill. That has not been graded away from the footprint of the House as it should have been. Hence, any water passing through the uncompacted fill is not then directed away but lies next to the slab.

59 In Mr McLaren's words, the slab was constructed in a hole instead of on a mound. In his review of Dr Baigent's report he stated:

> "It is important to note that if the underlying "subgrade" of the excavated surface is sloped away from the building then the surface drainage post construction becomes less significant as any surface water is still directed clear of the footing system. This was not completed by the builder."

As to the backfill used over this "subgrade, he said:

> "If permeable backfill is used in lieu of the clay, this allows water to permeate through to the reactive clay foundation adjacent to the footings. Swelling of the foundations and heave of the footing system results".

60 As to the extent of the damage, whether it is category 1, 2 or 3 I prefer the evidence of Mr McLaren over that of Dr Baigent. The cracks I saw were very large, numerous and extensive.

61 The photographs taken during construction show that the slab was left exposed while the frame constructed. They also appear to show no spoon drain or grading of the soil away from the foot bridge of the slab during construction. The final photograph taken just before the Owner moved in shows the uncompacted soil built up to the level of the rebate and more or less level with the foot path. This may have been the soil that earlier had been excavated for the site preparation that can be seen in some photographs piled at the back of the site but there is no evidence about that. Mr Love said that the presence of mortar on the top of that soil indicates that the bricks were laid after this soil was put in place and that is a reasonable conclusion.

62 As already stated, the photographs also indicate that, following construction of the roof and guttering, no temporary downpipes were attached to the

pops in the guttering into direct the water away from the footprint of the slab. Both Mr Dalhaus and Mr Wright, who was the site supervisor for the job, said that it is not the Builder's practice to fit downpipes until after the bricks have been cleaned.

63 The roof was put on before the brickwork was commenced and the period over which water would have drained from the roof through the pop in the gutter is unknown. However, the photographs indicate that there were still no downpipes at a time when the brickwork looked to be largely completed, albeit not cleaned.

64 Mr Dargan gave evidence that he has been a Builder for 27 years and has built over 80 Houses in the area near the House, 90% of which were on waffle pod slabs. He was not the supervisor of the construction of the House but said that he would have been on site a couple of times during construction and that they did a "photo shoot" after it was completed. He said that the supervisor was Mr Wright.

65 I accept the evidence that the soil is particularly reactive but that made it all the more important for the Builder to carefully follow the engineering instructions and avoid water reaching the slab footprint.

66 Weighing up the evidence it seems to me that the Builder has failed to prepare the site as directed in the engineering drawings by grading the soil away from the footprint of the slab and put in a spoon drain or other form of drainage so as to take water away from the footprint. It is also clear that, for an unknown period, but certainly for more than just a few days, any water that fell on the roof of the house in the vicinity of the north east corner, was directed directly onto the ground next to the north east corner of the slab which has experienced the greatest movement.

67 In regard to the alfresco area I accept the evidence that it is likely that this has settled due to the soil drying out. According to the drawings, this area was to have been covered with concrete by the Owner but, at her request, the Builder constructed a timber deck instead with gaps between the decking boards. According to the evidence, this has meant that soil that ought to have been covered by a concrete slab, which would have retained moisture, was able to dry out by evaporation. The problem was exacerbated because the Owner has constructed a roof over the area behind the garage and adjacent to the alfresco so as to create a large outdoor area.

68 I am not satisfied that there has been any defective workmanship demonstrated on the part of the Builder in regard to this area. It seems to me that the settlement is the result of the reactive nature of the soil coupled with the drying effect caused by the variation the Owner requested and the subsequent construction by her of a roof to protect the whole of the adjacent area from rainwater.

69 In conclusion, I am satisfied that the edge heave problems arose because of the Builder failed to excavate the site so as to grade the soil away from the

building footprint and then placed uncompacted fill up to the level of the rebate, so that any water entering the fill and reaching the level of the excavation would not be directed away from the House and would continue to effect the foundation of the slab. Since the clay at the level of the base of the slab was not sloped away from the footprint of the slab as required water is still able to reach the slab through the soil deposited around the edge of the slab by the Builder.

Rectification of the slab

70 Mr McLaren said that as an engineer he does not recommend waffle pod raft slabs on any site because of the higher risk of performance than with a conventional raft. He said that he would not have built a waffle slab on this land but he said that the site itself was not unsuitable for a waffle slab. He said that the problem was that the slab was built in a hole from which water could not escape.

71 In order to rectify the problem with the uneven heave of the slab Mr McLaren recommended the following items of remedial work. They are:

(a) Remove the decking in the alfresco area and pave underneath to a nominal thickness of 50mm in order to allow the ground moisture to recover.

(b) Provide drainage to the north east corner of the House. He said that the sub-base material should well compacted and shaped to ensure that it falls away from the building. The paving should also be graded to fall towards ground entry pits to collect surface runoff.

(c) A testing of all site services to ensure that there are no leaks.

(d) Provide the perimeter of the residence with paving that is graded away from the building by at least 50mm over the first metre and then 20mm per metre beyond that. He said that the sub-grade should also be graded to fall away from the building and be well compacted, with any granular material removed and replaced with compacted moist clay.

(e) It should be confirmed that the service trenches have been backfilled with clay.

(f) An agricultural drain to the rear of the House that was put in by the Owner on the recommendation of the Builder should be removed and the trench back filled with compacted moist clay.

(g) Accessible services to the perimeter of the building should be provided with a flexible joint.

72. Mr Dargan said that he believed that the slab would never stabilise because it would never be possible to maintain the same moisture conditions around the outside of the House. His qualification for making this statement was not established but Dr Baigent expressed a similar view. He said that the soil under the House will never stabilise because you will never be able to

maintain the same moisture content around the outside although it might slow down. He did not see any point in the scope of works that Mr McLaren recommended and Mr Love had costed. However it seems to me that Mr McLaren's recommendations are directed to that very problem, namely, directing water away from the footings. I prefer Mr McLaren's evidence that these works are necessary.

Who is responsible for what?

73. As to the works proposed by Mr McLaren, I am not satisfied that the first is the responsibility of the Builder. The drying out and settlement of the soil in the alfresco area arose as a result of decisions made by the Owner and she should bear the cost of rectifying that herself.

74. It appears that the site services have been tested and that no leaks have been found. There is no evidence that the service trenches have not been backfilled with moist clay. The Builder is also not responsible for the agricultural drain that the Owner has installed.

75. Otherwise, it seems to me that the balance of the work is necessary to make good the Builder's failure to provide sufficient drainage away from the footprint of the slab during and after construction. In order to stabilise the moisture content of the soil beneath the edge beams of the slab Mr McLaren recommended placing compacted clay around the edge beam and paving around the perimeter of the House. I accept his opinion in this regard.

76. Although paving around the perimeter of the House was not within the Builder's original scope of works it is now necessary because the site cut was not graded away from the footprint and so the water must be deflected at a higher level. The alternative would be to excavate the entire fill all the way around the House at an unknown cost. I think what is alleged by Mr McLaren seems a more economical and reasonable approach.

77. Mr McLaren said that the slab will never entirely recover but if the measures that he has recommended are taken it will recover to some extent.

Costing

78. Mr Love's costing, which is Addendum A to his report of 5 May 2015, sets out his assessment of the cost of carrying out the scope of works which has been recommended by Mr McLaren. He said that he had based his costing on Rawlinson's guide. He used a margin of 25%, a rate of $100 per hour for licensed trades and $75 per hour for other trades. There was some evidence from Mr Dargan concerning rates for tradesmen but no comprehensive costing of the necessary work apart from that of Mr Love.

79. In the absence of any other costing I will allow the amounts that he has assessed, less the amounts related to the alfresco area and with the following further qualifications.

80. Mr Love said that the concreting of the alfresco was 12.5 metres and so the figure for the concrete will be adjusted by deducting that from the 40 square

metres that he has allowed for. The two prior figures for the carpenter and dumping of materials relate to the external decking and that will not be allowed, nor will the figure of $2,900 with respect to materials and timber for decking.

81. The reinstatement of the landscaping will be allowed. I think that the installation of drain pick ups to all points is part of the landscaping that the Owner was responsible for so that will not be allowed but the re-installation of the existing landscaping will be.

82. The total then for the work required to rectify the defective slab is $14,412 base cost.

83. The rectification of the consequential damage will be allowed, save for the floor coverings. It has not been demonstrated these need to be replaced. I saw no cracked tiles on site.

84. The total of these items therefore is $17,700.40 for the repairing of the consequential damage which, together with $14,412.00 to rectify the faulty drainage amounts to $32,112.40 as a base cost.

85. The rectification of the cracks and damage said to be consequential to the slab movement are to be delayed until such time as the slab has recovered to the expected extent.

Item 2 - Vent pipes

86. The House has evaporative air conditioning and the unit sits on the roof between two vent pipes. According to Mr Love they are closer to the intake than is permitted and they need to be relocated. He has assessed a base cost of $1,296 for this work which includes the provision of two new Colourbond sheets for the roof. That amount will be allowed.

Item 3 - En suite shower slab

87. Towards the end of construction it was found that the drain below the en suite shower was blocked. The plumber, Mr Edwards, came in and cut out a section of the pipe and reinstated it. He said that it was blocked by a plastic bag and grout. Mr Edwards had to visit the site again when the toilet was found to be blocked by a brick. A rectangular section of the slab was cut out to give access to the sewer pipe which he repaired and he then taped the vapour barrier under the House and reinstated the slab.

88. The first of these repairs involved a relatively small cut which I cannot assume would have had any affect at all on the slab. The second repair involved cutting out a rectangle.

89. Mr Love said that in order to open a slab a builder must seek engineering advice as to the opening and reinstatement of all support systems such as steel reinforcement. He said that it must be documented and sent to the building surveyor. He said that termite protection should also be installed into the opening as required. This evidence is uncontradicted.

90. He said that none of this had been done and he costed for the removal of the shower screen, the stripping of all the tiles, jack hammering out the base and installing steel to an engineering drawing, water proofing the shower base and retiling the shower. There does not appear to be anything in his costing relating to the reinstatement of the slab in the bedroom that was cut out.

91. The scope of the work in the shower that Mr Edwards described appears to have been relatively modest. The Owner said that it was an opening of several tiles that was made and that she saw a barrow with tiles and foam removed from the House.

92. It is not suggested that any engineering advice was sought or obtained or that the reinstatement was inspected by the building surveyor or by an engineer. Dr Baigent considered that there was no difficulty and it was quite unnecessary to do the scope of works that was proposed.

93. The need for this work is said to arise from the failure of the Builder to involve the Building Surveyor and have an engineering design done for the opening. Prima facie, the Owner is entitled to have the House constructed in accordance with the Contract and that would include compliance with all legal requirements. The issue is simply whether to allow the cost of carrying out this scope of works would be unreasonable and the onus of showing that the cost of rectification is unreasonable is on the Builder.

94. However there is no allegation that the shower base is defective. The only complaint is that the cutting of the slab was not designed and inspected by an engineer. Given the evidence of Dr Baigent I think that it would be unreasonable to allow the cost of re-doing the whole of this work simply to allow it to be designed and supervised by an engineer.

Item 4 - Missing bolts

95. Two bolts are missing to a beam post in the front verandah. Mr Love has allowed a gross cost of $89.00 to insert them and that will be allowed.

Item 5 - Porch beams.

96. Mr Love said that a 5mm gap was required between the porch beams and the brickwork. The gap has been filled with mortar and he assessed a figure of $225.00 for a bricklayer to install a clearance and a carpenter to trim out around the gaps and paint it.

Item 6 - Gaps under windows

97. Mr Love said that the builder had not left a 5mm gap of the window frame and the brick sills to allow for frame shrinkage. He said that there was structural movement in displacement in the deforming of the aluminium frame to a large portion of windows. He has assessed a gross figure of $2,240.00 for all of the sills to be re-laid and reinstalled. Some deformation was pointed out on site. The amount he has costed will be allowed.

Item 7 - External power points not sealed.

98. Mr Love said that the external power points had not been sealed between the back of the fitting and the brick wall. He has assessed a cost of $100 for an electrician to seal the power points but it seems to me that this is something that a handyman could do with a silicone gun. I will allow $50.00.

Item 8 - Stepping brickwork

99. The mortar beds either side of an articulation joint at the front of the house mismatch by a few millimetres. Mr Love says that the Australian Standard AS 3700-2001 Table 11.1 Section F, calls for a maximum of 2 millimetres and the stepping at this join is 4 times that.

100. I thought that the difference in level was scarcely noticeable. Mr Love has assessed a base price of $3,400 to render the whole House to take account of this and what he says are some other brickwork defects.

101. I do not think that is justified and if the amount were allowed I scarcely think that the Owner is going to spend the money having the House rendered. Not only would it be excessive but also, the House is expected to be moving for some unknown period until the slab stabilises so that, if it were rendered, the render would crack every time it moved. I think a more appropriate course is to allow $500.00 for a small deficit in appearance.

Item 9 - Hallway wall.

102. The hallway wall is out of plumb and this was demonstrated at the view. However the costing allowed for Item 1 takes account of this.

Item 10- Tiling in shower base

103. Mr Love says that the tiling to the shower base has been installed without allowances for gaps and tolerances between the tiles and the grout joins. He says there is also no support to the tiles near the drain point. He said that the tiling to the showers base needs to be reworked, that the joins between the tiles are not consistent in width and alignment where the grout gaps are.

104. His main concern appears to be that insufficient grout can be inserted between the tiles to render the floor water resistant and so prevent water from entering under the tiled areas. I thought that on site the tiling in the shower base looked neat although the gaps were not uniform.

105. Nevertheless, on Mr Love's evidence I must find that the tiling on the shower base needs to be reworked. He then goes on to say in his report:

> "The sub-base was structured to accept a poly marble shower base. I was informed that an opening in the slab was installed with the pipe into the hallway at the back of the shower. This is not the correct method for installing a tiled shower base. There is no support under the tiles and this can be proved during a site inspection with the member if this matter proceeds."

106. The Owner's evidence was that it was discovered during construction that the recessed floor for this shower was partly in the hallway and the waste pipe was hard up against the wall.

107. On Mr Love's evidence I must find a defect and the amount he has assessed of $3,372.87 will be allowed.

Item 11- Steel bracing

108. The steel bracing connected to the trusses has only one nail to each instead of two as required by the fixing details. Mr Love has costed a base figure of $1,340.00 for a carpenter to rework all the bracing and install new bracing to the underside. That will be allowed.

Item 12- Roof trusses

109. Mr Love said the roof trusses have not been secured in accordance with the supplier's instructions in that there were inadequate nails. It is anticipated that this will be dealt with along with the previous item and the cost is included in the allowance for that.

Item 13- Sarking

110. The sarking has not been installed with a minimum of overlap of 150mm. Mr Love has allowed 4 hours for a plumber to rectify, making a base cost of $400.00 and that will be allowed.

Item 14 - Down lights

111. Mr Love allowed $784 to replace all the down lights with cool LED lights. The Builder has already rectified this item and it is removed.

Item 15- Insulation

112. The insulation in the ceiling is installed incorrectly in that batts appear to have been moved and are missing in some areas. The cost of this is taken up in the costing of Item 1.

Item 16 Gutters

113. Mr Love says that the gutters on the house have no overflow ability. The problem arises from the fact that the external lip of the gutters is higher than the fascia and since the gutter is hard against the fascia any overflow would be into the roof space over the fascia. He has assessed a cost of 32 hours for a roof plumber to remove and replace the gutters to all pipes in the dwelling plus $1,142 worth of material, giving a base cost of $4,342.00. That will be allowed.

Cost of rectification

114. The total base cost plus margin and GST is as follows:

Rectification of slab	$14,412.00
Repair of consequential damage	$17,700.40
Vent pipes	$ 1,296.00

Missing bolts	$ 89.00
Porch beams	$ 225.00
Gaps under windows	$ 2,240.00
External power points	$ 50.00
Stepping brickwork	$ 500.00
Tiling in shower base	$ 2,453.00
Steel bracing	$ 1,340.00
Sarking	$ 492.00
Guttering	$ 4,342.00
Total base cost	$45,139.40
Add margin of 25%	$11,284.85
	$56,424.25
Plus GST	$ 5,642.42
Total	$62,066.67

Orders to be made

115. There will be an order that the Builder pay to the Owner $62,066.67. Costs will be reserved.

SENIOR MEMBER R. WALKER