Neutral Citation Number: [2017] EWHC 558 (TCC)

Case No: HT-2015-000349

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION
TECHNOLOGY AND CONSTRUCTION COURT

Royal Courts of Justice
Rolls Building
Fetter Lane, London, EC4A 1NL

Date: 11 April 2017

Before:

THE HON MR JUSTICE COULSON

- -

Between:

Leeds Beckett University (formerly Leeds Metropolitan University)	**Claimant**
- and -	
Travelers Insurance Company Limited	**Defendant**

- -
- -

Mr Alexander Hickey QC (instructed by **Addleshaw Goddard LLP**) for the **Claimant**
Mr Marcus Taverner QC and **Mr Julian Field**
(instructed by **DAC Beachcroft LLP**) for the **Defendant**

Hearing dates: 28 February, 1, 2, 3 (Site Visit), 6, 7, 8, 9 and 14 March 2017

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Judgment Approved

Mr Justice Coulson :

1. INTRODUCTION

1. Between 1993 and 1996, the claimant ("the University") carried out an ambitious building project on the site of the former Kirkstall Brewery, on both sides of the Leeds-Liverpool canal in north-west Leeds. The project involved not only the refurbishment of the existing brewery buildings, but the design and construction of several new accommodation blocks. Because these blocks were designed to match the existing buildings, they were, from an aesthetic point of view, considerably more attractive than the typical undergraduate block. The largest of these buildings, containing both the Bridge Building (F1) and the Turner Building (F2), was located adjacent to the western bank of the canal. I shall call it "the F1/F2 Building". It is shown on ***Figure 1***.

2. To accommodate the slope from west to east, the F1/F2 Building had been designed and built with an undercroft. On the western side, this was only a few inches high but, because of the slope, on the eastern (canal) side the undercroft was about 5 feet high (although access was well-nigh impossible). The eastern wall consisted of a concrete beam laid across pile caps, with courses of concrete blockwork on top of the beam to support the inner and the outer leaves of the wall. The blockwork of the inner leaf was

exposed inside the undercroft, although on the outer leaf the ground level was higher and covered it up. The F1/F2 Building was completed in 1996.

3. On the night of 13 December 2011, just over 15 years later, large cracks appeared on some of its internal walls and ceilings on the eastern (canal) side. Because these cracks were not mirrored in the external stonework, those investigating the problem quickly worked out that there was a problem with the inner leaf of the eastern wall. Because of the size and location of the cracking, and the fact that the wall was over 4 storeys high, the F1/F2 Building was evacuated. Investigations over the following few months revealed that an area of concrete blockwork below ground level, which supported the inner leaf, had 'turned into mush', with no structural strength at all. Later in 2012, the decision was taken to demolish the entire F1/F2 Building. It is common ground that this was due to the effects of flowing water, although there are numerous disputes beyond that as to the precise mechanics of causation. Today, the site is a patch of rather boggy waste ground, criss-crossed with drains designed and built since the demolition to deal with the groundwater that runs across and down this site.

4. The University insured its buildings with the defendant insurers. They made a claim under the terms of the policy. On 31 May 2012, that claim was declined. Later in 2012, the University decided to demolish the F1/F2 Building. In these proceedings, the University seeks declarations to the effect that the defendant is liable to pay for the damage under the terms of the insurance policy. Those claims are denied. There is currently no claim for quantum because the insurance policy included a rather odd clause to the effect that a dispute about quantum would be dealt with by way of arbitration. The value of the claim may be in excess of £10 million.

5. The structure of this Judgment is as follows. In **Section 2**, I set out the relevant terms of the insurance policy, identify some of the important pleaded issues, and then list the five principal disputes that arose at trial. In **Section 3,** I summarise the evidence relating to the site. In **Section 4,** I deal with the design and construction of the F1/F2 Building. In **Section 5,** I set out the events of 13 December 2011 and the extensive investigations thereafter. In **Section 6** I set out my detailed findings as to the cause of the damage. Thereafter, at **Sections 7-11,** I deal with the five principal disputes that arose in this case: whether or not there was accidental damage; if there was, whether the claim was excluded as a result of the damage being caused by gradual deterioration, or faulty/defective design, or contamination; and if the claim was excluded, whether it was saved by the proviso to the relevant exclusion clause. There is a brief summary of my conclusions at **Section 12**. I am very grateful to leading counsel on both sides for their efficient and effective presentation of the case at trial.

2. THE INSURANCE POLICY, THE PLEADINGS, AND THE ISSUES AT TRIAL

2.1 The Insurance Policy

6. The cover was described in these general terms:

> "**General**
>
> If during the Period of Insurance the Property Insured described in the Schedule or any part thereof shall be damaged (other

> than by an excluded clause) the Company will pay to the Named Insured the value of the Property or the amount of the Damage at the time of the happening of such Damage in accordance with Basis of Settlement (or as otherwise provided for herein) or at the Company's option reinstate, replace or repair such Property or any part thereof provided that the liability of the Company shall in no case exceed in respect of each insured item the Sum Insured for that item in the Schedule or in the whole Total Sum Insured"

7. The period of insurance was from 1 August 2011 to 31 July 2012. Although there were policies covering earlier years back to 2008, they do not seem to me to be relevant to this dispute. Indeed, as Mr Taverner noted in his closing submissions, the University's claim is based on the assertion that the relevant damage occurred in 2011 and that earlier events were "immaterial": see paragraph 14 below.

8. The relevant exclusions were stated as follows:

> "The insurance provided under this Section does not cover
>
> 1. Damage caused by or consisting of
>
> (a) inherent vice latent defect gradual deterioration wear and tear frost change in water table level its own faulty or defective design or materials…
>
> but this shall not exclude subsequent Damage which itself results from a cause not otherwise excluded [*the proviso*].
>
> 2. (a) Damage caused by or consisting of
>
> (i) corrosion rust wet or dry rot shrinkage evaporation loss of weight dampness dryness marring scratching vermin insects humidity contamination or action of light…
>
> but this shall not exclude…
>
> (b) other subsequent Damage which itself results from a cause not otherwise excluded…
>
> 5. Damage caused by pollution or contamination but this shall not exclude Damage to the Property Insured not otherwise excluded caused by
>
> (a) pollution or contamination which itself results from a Defined Peril.
>
> (b) a Defined Peril which itself results from pollution or contamination…

> 7. Damage to buildings or structures thereat caused by their own collapse or cracking unless resulting from a Defined Peril insofar as it is not otherwise excluded…"

9. There are two relevant definitions for present purposes:

   (a) 'Damage' or 'Damaged' was defined as meaning "accidental loss or destruction of or damage".

   (b) 'Defined Peril' was defined as meaning:

   > "fire lightening explosion aircraft or other aerial devices or articles dropped there from riot civil commotion strikers locked-out workers persons taking part in labour disturbances malicious persons earthquakes storm flood escape of water from any tank apparatus or pipe or impact by any road vehicle animal".

2.2 The Pleadings

10. These proceedings were commenced under CPR Part 8, on the basis that the University maintained that no evidence was required to determine their claim. That was a surprising position, given the amount of evidence that was subsequently called at trial. In the face of opposition from the University, the defendant sought and obtained an order that the case proceed under CPR Part 7.

11. In the Amended Particulars of Claim ("APoC"), the University alleges:

   (a) that the structural failure of the concrete blocks at the base in the middle of the F1/F2 Building on the eastern wall was caused by mobile water-borne sulphates brought into contact with the concrete blocks (paragraph 14 of the APoC);

   (b) that the waterborne sulphates came from an external source, namely a spring that emerged in, and flooded, the undercroft in the middle of the F1/F2 Building (paragraph 15);

   (c) that it was "plausible" that the eastern wall had been attacked by a flood intermittently at various times from the spring emerging whenever the hydrological conditions were right, and that this was likely to have occurred during the period when the defendant "were on cover" from 1 August 2008 (paragraph 15).[1]

12. At paragraphs 16 and 17 of the original PoC, it was alleged that December 2011 was the first occasion when there was factual evidence of water being within the footprint of the F1/F2 Building, and that there was no factual evidence of any *live spring* when the F1/F2 Building was constructed. Those allegations were subsequently amended, and the University's case became that there was no factual evidence of any *live watercourse* within the footprint of the F1/F2 Building when it was constructed. It

[1] As noted in paragraph 7 above, the relevant period of cover for present purposes in fact began in August 2011. It was not suggested that the earlier insurance policies were relevant.

was also accepted by the University that, contrary to their initial position, spring water was encountered on site during the works in 1993-1996, but paragraph 17 of the APoC went on to say that "these issues of water were resolved by implementing a system of land drainage after which there was no water courses encountered or reported".

13. In addition, although paragraph 18 of the original PoC had alleged that "hydrological conditions in the local area at the time of construction in 1995 were dry so that it was unlikely that there was a spring present when the building was constructed", that allegation was deleted on amendment. Paragraph 18 of the APoC continues to allege that there was no factual evidence to demonstrate when on any other occasion the spring came into contact with the blockwork. That paragraph also alleges that "there was a prolonged much wetter period in the local area from about 2007 onwards", although that specific allegation was not opened, nor the subject of any subsequent evidence.

14. Having set out various arguments relating to the defendant's declinature, at paragraph 31 of the APoC, the University alleges:

> "But for the flood (the fortuity of the stream carrying water-borne sulphates to flood and attack the concrete blocks in the middle of the building) the destruction of the blocks and structural failure of the building could not have occurred. The proximate event which caused the damage to happen was a flood in 2011 which caused the failure of the blocks. It is immaterial if earlier floods may have led to the blockwork to become progressively weaker through sulphate attack prior to 2011."

15. In the Amended Defence ("AD"), the defendant alleges that:

    (a) there was a long standing zone of water seepages and springs ("issues") whose origin from this strata had given rise to an unnamed water course running down to the canal shown on various maps (paragraph 14(1));

    (b) there was evidence of mine workings at a depth of between 7.9 metres and 16.4 metres below ground level immediately adjacent to the footprint of the building (Paragraph 14(3));

    (c) in addition to the water course and issues, there was sub-surface water flow across the site with preferential, high transmissivity sub-surface flow paths in the zone below the line of the mapped water course (paragraph 14(4));

    (d) there had been warnings about sulphate attack at the time of construction (paragraph 14(4A));

    (e) springs were present in and around the footprint of the building during the development of the site (paragraph 14(8A)).

16. Paragraph 18 of the AD admits that the blocks had been damaged by sulphate attack, but added that the damage to the concrete blockwork was not confined to the middle

of the eastern wall and that, as well as sulphate attack, there was also damage caused by water leaching, which facilitated the sulphate attack. Paragraph 21 of the AD makes various allegations about the design of the land drainage, although the pleading makes plain that the information provided as to land drainage (as designed and as built) was incomplete. It alleges that, on the basis of the available data, the land drains were at a lower relative level than the surface water drainage system to which they were connected, so that the land drains would not drain water from the undercroft into the surface water drainage system (paragraph 21(3A)b).

17. At paragraph 31(6) of the AD, the defendant denies that there was a fortuity in the form of the intervention of a stream, asserting that "live springs were present within and adjacent to the footprint of the building prior and during construction of the building. These springs were allowed to continue to flow, as the only action taken to address the problems presented by these springs was, according to the University, a system of land drainage." Paragraph 32 of the AD denies that the F1/F2 Building was attacked by accidental flood damage. The remainder of the AD asserts reliance on exclusions relating to gradual deterioration, faulty design, and contamination from mine workings and mine shafts.

2.3 The Disputes at Trial

18. Although, in their respective written openings, the parties addressed broadly similar disputes[2], it was notable that they defined them in rather different terms. It was also notable that these disputes differed somewhat from the pleadings. In my view, the principal disputes I have to decide are those set out below:

    (a) Was the damage "accidental damage" within the meaning of the policy?

    (b) If it was, was it the subject of the exclusion for gradual deterioration?

    (c) Alternatively, was it the subject of the exclusion for faulty or defective design?

    (d) Alternatively, was it the subject of the exclusion for contamination?

    (e) If the damage was the subject of one or more of the exclusions at (b), (c), and (d) above, was the claim for the cracking caught by the proviso to the exclusion clauses relating to "subsequent damage" resulting from a "cause not otherwise excluded"?[3]

3. THE BREWERY SITE

3.1 General History

19. The brewery site is on a steep slope running downwards from west to east, which ends on the western side of the Leeds-Liverpool canal. JMW Turner stood on the site of the F1/F2 Building in 1824 to paint the view looking north up the canal. The road bridge,

[2] I would normally use the word 'issues'. However, in this case, that word has a very different meaning, relating to those places on site where spring water is issuing out of the ground. Accordingly, I have endeavoured to use the word 'issues' in this Judgment to refer to hydrological matters, not the disputes between the parties.
[3] I should note that this fifth dispute, in respect of the proviso, was controversial in itself, because it was the defendant's case that it had not been pleaded or evidenced.

which carries the road over the canal and marks the north-eastern tip of the site, is still there. Turner depicts the site as a quarry, with men in the foreground cutting large stone blocks. The steeply-sloping nature of the site is apparent from his painting.

20. It appears that there was a brewery at the southern end of the site from about 1830. In the 1870's the whole of the site was acquired by Kirkstall Brewery. They constructed a number of fine mid-Victorian industrial buildings at the southern end of the site which remain today. The part of the site where the F1/F2 Building was to be located, north of the brewery buildings, was not developed. Instead, as described in greater detail below, it appears to have been a wooded area criss-crossed by water and springs which were diverted for use by the brewery.

21. The brewery operated for about 100 years until 1983. Following closure, the buildings stood empty until the development project undertaken by the University in the early 1990's. I note that the Wikipedia entry for Kirkstall Brewery says this of the development:

> "The renovation project was a challenging one; the springs and water courses that provided the water used in the brewing process had to be diverted without damaging the unique ecosystem that is a recognised Site of Special Scientific Interest" ["SSSI"].

22. That the site was a SSSI – apparently because of the presence of particular reeds growing along the western canal bank – was a factor that was often in the minds of those involved in the design and construction between 1993 and 1996. Indeed, the impression given by the contemporaneous documents is that those involved were so concerned to ensure that the water on the site was dealt with in a way that did not harm the SSSI, they sometimes forgot that it was equally important to ensure that the water was dealt with in a way which did not damage the new buildings.

23. The renovation project involved the refurbishment of the brewery buildings at the southern end of the site. In addition, five large new accommodation blocks were built further north. Buildings B, C and D were on the western most part of the site, and therefore at the highest level or terrace created by the development. Building E was in the middle of the site and because of the slope, its eastern elevation was at least two storeys higher than its western elevation. The lowest terrace, and the one closest to the canal, was the location of the F1/F2 Building. Although it was one large unit, for administrative purposes it was divided into two. The southern end, next to the footbridge running over the canal, was called the Bridge Building (F1). The much larger building at the northern end was called the Turner Building (F2).

24. As noted above the F1/F2 Building was utilised for just over 15 years before the cracking and evacuation in December 2011. It was demolished in 2012 and nothing has been built to replace it. Happily, all the other buildings on the site remain intact, undamaged and occupied.

3.2 The Watercourse

25. The earliest map of the brewery site, dated from 1851-1852, shows the site of the F1/F2 Building as wooded slopes, with the word "wells" noted. That word is not on

the map for 1892. By 1909, a structure, which was said to be some form of tank, was on the site of the F1/F2 Building. This was consistent with the evidence that the brewery collected the water that ran over the empty part of the site north and west of their existing buildings, and piped it southwards for use in the brewing process. However, the tank is not shown in the O/S maps for 1933 and 1938.

26. In 1954, the O/S map scale 1: 1,250 shows the area to the north of the brewery, where the F1/F2 Building was going to be built, in some detail. It shows a patch of wooded ground with a rectangular structure that the evidence again suggested was a tank. Next to the tank is the word "issues", which the experts agreed was a reference to water issuing from the ground. There is then a dotted line flowing down the slope in a relatively straight line, into the canal. The O/S map indicates a small bay or inlet in the western side of the canal bank, where that watercourse entered the canal.

27. In the O/S map for 1956-1957, on a scale of 1: 10,000, the trees have gone but the structure and the watercourse remain as before. The O/S map for 1965-1968, at a scale of 1: 10,000, does not show this watercourse, but the map for 1964-1976, at the smaller scale of 1: 1,250, does show it. It also refers to the word "issues". The watercourse appears to be slightly shorter in length than its previous representation, but the small bay is still present. The O/S map for 1967-1970 shows the trees, the tank and the watercourse at its full length. The shorter watercourse is shown on the O/S map 1981-1989 (scale 1: 10 000) and, more clearly, on the O/S map for 1993, scale 1: 1,250. The word "issues" is again repeated.

28. The existence of this watercourse in the location shown on these pre-development O/S maps is important. Subsequent investigations were to demonstrate that, not only was the F1/F2 Building built across the site of the watercourse, but the principal area where the concrete blocks had been turned into mush was precisely where the watercourse shown on the O/S maps traversed the eastern wall of the F1/F2 Building (see ***Figure 2***).

3.3 Other Water on the Site

29. As indicated above, before the University acquired the brewery site, there was evidence of water there, particularly in the area where the new buildings were to be built. That can be seen in the map references, first to "wells" and then subsequently in the repeated references to "issues".

3.4 Mining

30. In common with large parts of West Yorkshire, the area around the brewery site had been extensively mined. The best evidence of mineshafts prior to any work being undertaken comes from the letter from British Coal dated 17 November 1993. They said:

> "According to our records, which may not be complete, two shafts are situated under or close to the property.
>
> For your information, I have indicated the shafts on the attached plans.

> Please note that due to the varying age, scale and accuracy of plan information held by British Coal, plus projection difficulties, only approximate positions can be known.
>
> British Coal has no record of what steps, if any, were taken at the time of abandonment, to render the shafts safe, or of any subsequent treatment afforded thereto.
>
> The records held by British Coal may be incomplete. Consequently there may well exist in this locality shafts and adits which British Coal have no knowledge…
>
> In view of the mining circumstances a prudent developer would seek appropriate technical advice before any construction works are undertaken on site… in any event, no activity should be undertaken that intersect, disturb or interfere with any coal or mines of coal without the prior written approval of this office."

31. The map provided by British Coal with their letter was dated 19 November 1993. It showed the locations of the two mine shafts to which they had referred. They were on the north-eastern side of the site, just to north of the watercourse. The map described them as "the approximate location(s) of known disused coal mine outlets under or close to the property to which the attached report relates…"

32. Investigations have shown that the location of the southern mineshaft (as indicated by British Coal) was within the footprint of the F1/F2 Building, in the area of the greatest blockwork damage. The northern location was just beyond the north-eastern corner of the F1/F2 Building. They are marked on ***Figure 2***.

4. THE DESIGN AND CONSTRUCTION OF BUILDING F1/F2

33. Inevitably, this Section of the Judgment is principally taken from the contemporaneous records. On behalf of the University, Mr Hickey was anxious to emphasise that, because those records were incomplete, the court should be careful before reaching conclusions based upon them. I agree that some care is needed, because some records have not survived. On the other hand, for present purposes, I am satisfied that so many of the key events (and non-events) between 1993 and 1996 are evidenced by so many different surviving documents, that a clear picture of what happened can be readily ascertained.

4.1 The Sub Surface Reports

34. In late 1993, following their purchase of the brewery site, the University considered how best to procure their development. Originally, in 1993, developers called Cormorant were involved, although thereafter a decision was taken to dispense with their services, and to procure the works directly through a design and build contract. At an early meeting on 13 October 1993, when Cormorant was still involved, a number of "areas of risk" were identified. These included the lack of survey information and drainage. Mr Franklin, the University's drainage engineer, agreed that, for this site, drainage was a risk.

35. A ground investigation was commissioned by Cormorant and carried out by Sub Surface Limited ("SSL"). Their first report was dated December 1993. It consisted of a factual section (the results of bore holes and the like) and an interpretive section. This set out the following in respect of proposed Building F:

> "Due to access restrictions[4], an investigation of the area around Building F was restricted to Probe Holes P7, P8, P9…
>
> Clearly without samples it is extremely difficult to interpret the results of the dynamic probing but, in our opinion, it is likely that fill material was encountered to depths of at least 1m to 3.5m and bedrock possibly encountered at 4.2m and 5.2m in Probe Holes P8 and P9 respectively…
>
> Further investigation of this type will be essential prior to preliminary foundation design in order to confirm the thickness of the fill material, bedrock level and if present, the nature of the material in between…"

36. The report expressly drew attention to the sulphate content/pH value test results. The report later noted that two of the five samples tested exceeded the threshold of levels of sulphate. SSL noted that sulphate was not generally hazardous to health "but can attack buried concrete". The report then went on to note that the water-soluble sulphate fraction was relatively low and the ground conditions satisfied the Class 1 conditions of BRE Digest 363. In relation to contamination generally, SSL recommended that "careful observations are taken during the site works and if any areas of possible contamination are found that further testing should be carried out".

37. The SSL first report also contained a detailed section relating to the mine shafts. They noted that the two recorded mineshafts on the site, "along with other evidence of coal workings local to the site" provided a strong argument for coal having been worked beneath the area of the proposed developments. They advised that the two recorded mineshafts should be located, saying that "both mineshafts are indicated as being within 10 metres of building F."

38. There was a lengthy section of the SSL report dealing with the hydrogeological evaluation. That warned that water had been extracted in the process of mining "and some contaminated mine waters may be present in and around old mine workings". The report went on:

> "Visual observations on site show a broad band of 'water issues' approximately halfway down the hillside which may be two different lines. It is likely the issues relate to the Elland Flags and a mudstone or shale interface. Though a full survey was not carried out infiltration into the strata is likely to be limited to small surface outcrops further up the slope and hillside. It was also noted that the site had been developed in

[4] The alleged access restrictions remain a mystery (the site was empty), but they meant that there was no proper survey of the most important part of the brewery site for present purposes, namely the area of the site close to the canal where the F1/F2 Building was built.

> the past and many of the issues appeared to be channelled water… with regard to the future development of the site, if the ground water monitored in the probe holes is related to the issue referred to above, extensive development may affect water flow. However, if the water is not related to the main aquifer and assuming the water flow follows a hydrometric surface (downhill) development using deep strip footings would hinder the water flow. In addition, where permanent cuttings and retaining walls are to be constructed, long term containment of the shallow water may occur, and where cutting into rock, depression of the spring line is possible. The ground water in the area may be also have been affected by contaminated mine water from the two mine shafts nearby".

39. In their conclusions to the hydrogeological section of their report, SSL said:

> "It is not clear whether the issues/springs are from a rock face and represent the main aquifer or alternatively are from surface deposits but as the water issues two thirds of the way down the slope it is not likely to supply the main hillside i.e. in terms of vegetation etc. In addition, though the water eventually runs into the canal, 'it does not fill it up'.
>
> Based on the available data, it is therefore likely that the water in the probe holes and bore holes is shallow surface water. Development of the site and probable releveling/terracing of the slope close to possible old mine shafts could give rise, in certain circumstances, to breaching of possible flooded shafts, resulting in iron and sulphate rich waters issuing and affecting surface vegetation and leading to contamination of the canal."

40. I find that anyone reading the SSL report would have readily concluded that this was going to be a difficult site to develop because of the numerous water issues. It would also have been apparent that SSL were expressly recommending further ground investigations, which might prove to be quite extensive.

41. At a meeting on 1 December 1993, the University's engineers (Curtins) "confirmed that mine workings had become apparent." Curtins said that they would ascertain the extent of these workings via SSL. However, at a subsequent meeting on 13 December, this proposal was scrapped, and Curtins advised that, although mine workings had become apparent, "they would not be investigated at this juncture". It is not clear why this change came about or why, given the terms of the SSL report, it had been decided that the mine workings were not going to be investigated.

42. SSL produced a supplementary ground investigation report in January 1994. The report made plain that it presented the details "*of part* of the additional investigation work recommended in the earlier Report" (emphasis added). Of course, one area where SSL had recommended further works was the investigation and location of the mine shafts. But SSL's further investigation focused around bore holes R1A and R2A which were said to be a "preliminary investigation" into the possibility of mine

workings being present on the site, and which, as the location plan showed, were nowhere near Building F, or the two mineshafts identified by British Coal.

43. The supplementary SSL report again drew attention (at paragraph 3.2) to the sulphate content and pH value determinations made on selected soil samples. In relation to the soil profile, SSL expressly warned "that only a small proportion of the area under consideration for development has been sampled and consequently the recommendations made and opinions expressed in this Report can only be applied to such conditions as encountered in the bore holes". That may explain why, although the effect on some of the proposed new buildings was expressly identified in this report, there was no section dealing with the F1/F2 Building (presumably because there were no bore holes carried out anywhere near the F1/F2 Building).

44. Borehole R2A was at the southern end of the site, where the existing brewery buildings were. SSL reported that additional evidence of mine workings had been provided by that borehole, because loose drilling had been encountered between 7.9 metres and 16.4 metres. The report went on to say that the nature of the ground conditions encountered did not conclusively prove the presence of old workings but, due to the evidence from this borehole and the contents of the first report, SSL recommended "an extensive investigation of any possible workings". They said that this was "essential" prior to any development of the site".

45. Notwithstanding the clear nature of this warning, SSL were not asked to carry out any further investigation. Whilst there is no clear explanation for this in the papers, one clue as to why this did not happen can be found in the minutes of the meeting of 25 January 1994. A query was raised about a sum of £16,000 odd which had been mentioned as additional ground investigation costs. Curtins advised that they considered that figure to be excessive and would investigate the quotation submitted by SSL. It would therefore seem more likely than not that the further ground investigations were not carried out for reasons of cost.

4.2 The Landcare Report

46. In January/February 1994, a company called Landcare carried out a hydrological survey on the site. This was focused on Building F. It was a document repeatedly referred to at the trial, as was the plan attached to the report, reproduced as ***Figure 3*** to this Judgment. It is therefore appropriate to set out the relevant part of their report in full:

> "Hydrological Proposals
>
> The purpose of this report is to present the results of hydrological survey work undertaken and the options possible concerning the management of groundwater in the vicinity of the proposed Block F and the Leeds Liverpool canal.
>
> Survey
>
> Information concerning the ground water was collected by different means which have all confirmed the prevailing conditions

(a) SubSurface Ltd. investigated the underlying geology as part of the Geotechnical study. This showed that the Elland Flags outcrop in this area and, as they as an aquifer, suggests that the water issues observed on the site are natural springs.

(b) Historical information gathered by Peter Brears of Leeds City Museum service indicated that Monks Wood concealed 'crystal clear water springs'. In 1863 four springs were diverted into tanks which were used to supply the brewery.

Adrian Norris of Leeds City Museums, who has had considerable involvement in this woodland, confirmed spring water was collected in tanks and culverted to the brewery. The locations of these tanks, or at least two/three of them are visible on the site but the route of the culverts have yet to be investigated.

(c) Probe holes were placed by SubSurface Ltd. and monitored. Probe holes No's 7, 8, 9, 10 and 11 lie within closest proximity to the issues area and indicated water levels within 1.10 – 1.85m of the surface. This is again consistent with other data collected.

The issues observable on site are indicated on the attached plan [***Figure 3***] with their current known or probably flow directions. There is no evidence that there is any longer flow into the Brewery complex, indeed a water holding tank within the Brewery is known to be empty.

Water samples have been taken from the main issues and results are appended to this report. These results indicate the water to be of good quality free of any pollutants. Visual observations also indicate the water to be free of any particulate material.

Water Management Proposals

The purpose of water management is to ensure that only clear unpolluted water enters the Leeds and Liverpool canal so no detrimental effect occurs to the water quality and the vegetation within the canal or on its banks during or subsequent to construction of the development.

Issue Nos. 2 & 3 – these also appear to be collection tanks and it is probable that they outflow at issue 4 and thence 4a. This is confirmed by the water analysis which shows almost identical readings.

There are two options as to how the water from these may be managed depending at what depth the water issues:-

Option 1 – if the water issues at depth then it will need to be culverted under Block F and can continue to outfall at issue 4 and 4A. The Civil Engineers for the project indicate that this is an acceptable method as the building is to be constructed on piles.

Option 2 – if the water issue is shallow it would be best piped round the top of Block F, and particularly the retaining wall below the parking areas, and into the upper pond. In order for this to be a possibility the issue would have to surface at a level above 44.43 which is the upper level of the existing pond.

Which option is pursued will become evident when excavations for Block F are undertaken and the depth of the water issues ascertained.

Issue No. 5 – this currently appears to maintain a marshy area below the existing brewery outbuilding (northern end) although there is no specific channel evident. Again, two options for management exist.

Option 1 – that it is culverted under Block F to join up with the culvert from issues 2 & 3 to outfall at 4 and 4A.

Option 2 – that it is culverted under Block F to outflow above the existing marshy area so that the water regime in this area is maintained.

It is suggested that option 2 would be both the most economical and beneficial to the ecology of the canal bank…

Issue No. 7 – occurs a point where a survey peg had been driven into the ground and is, therefore, more likely to be a perched water table rather than a spring issue. The intended excavation of this area will reveal the situation and appropriate remedial measures taken.

In addition to these long term water management options, there are short term considerations concerning ensuring very muddy/silted water does not reach the canal during the excavation and construction…

It is apparent the water currently flowing into the canal is clear and unpolluted. By adopting the measured outlined previously this beneficial scenario can continue without detriment to the development or ecology of the canal and its banks."

47. It will be seen from ***Figure 3*** that issues/springs 2 and 3 arise immediately to the west of the proposed F1/F2 Building, whilst issues/springs 4 and 5 arise underneath the footprint of the F1/F2 Building itself. Moreover, for issue/spring 5, both of the recommended options required culverting.

4.3 The Excavation Works

48. After February 1994, there was then a delay of some seven or eight months when nothing further happened in relation to the proposed development. It appears that this is when the procurement method changed. The University entered into a design and build contract with Morrison Construction Ltd ("MCL") and it appears that their contract with Curtins the engineers was novated in favour of MCL. Something similar happened to their contract with the architects, Bowman Riley Partnership. However, the University continued to retain two independent advisors. One was Phillip Webb of DTZ a building surveyor; and the other was David Charters, an engineer. His firm, David Charter Associates ("DCA") later became Peters Associates.

49. Mr Webb was the only witness at trial who had been present during the construction works. He was a palpably honest witness with a relatively good recall of the detail although, given the passage of time, he was inevitably guided by the contemporaneous documents. His evidence was largely consistent with those documents, some of which I set out below. Because of that, I have only found it necessary to refer to his oral evidence on one specific issue, concerned with the watercourse, at paragraph 172 below.

50. In the light of those observations, I was surprised to see in Mr Hickey's closing Aide Memoire repeated references to Mr Webb's evidence, and numerous arguments based upon it, with no – or next to no – references to the expert evidence adduced by the University at trial. This is particularly striking when so many of the key disputes in the case, such as what should have been done at the time, and the precise cause of the damage, were properly matters of expert evidence. The repeated reliance on Mr Webb instead led me to conclude that Mr Hickey did not feel able to rely on much of what his experts had said in evidence. As this analysis unfolds, it will be seen that, in my view, he was right to be so circumspect. I consider that the overwhelming weight of the expert evidence was contrary to the University's case, and that Mr Webb's factual evidence was not an adequate substitute.

51. At a meeting on 31 August 1994, there was a reference in the minutes to "mineshafts/fill returns". It was noted that Curtins would investigate the location of these as quickly as possible. It appears that some further work was done because, by the meeting on 20 October, investigations had been carried out at what was variously referred to as a 'cavern' or a 'pit' on the existing brewery site. At that meeting, the view was ventured that it was "possible" that this was one of the mineshafts "which is known to be on the site near to the position of the proposed Block F1/F2". DCA recommended the possibility of infra red photographs to identify the mineshafts, but it seems that nothing came of this proposal. At the same meeting, it was again said that Curtins would investigate the locations of the mineshafts as quickly as possible and would update DCA once on site.

52. On 21 October, DCA produced a document entitled 'Structural Monitoring'. Under a list of outstanding matters, the first item was "the location of mineshafts and rumours

of a filled cave required to be resolved. Additional investigative work will be required in this respect and also to establish the integrity of strata underlying the site or confirm the presence of loosely filled workings".

53. Mr Webb produced what were called Project Status Reports from this time on. His report of 31 October 1994 referred to questions of drainage. There was also the problem of the SSSI. Mr Webb noted:

> "…the canal adjacent to Kirkstall Brewery is designated site of special scientific interest. Under the Section 106 agreement it is necessary to satisfy British Waterways Board, English Nature and Local Authority that the contractors proposals for carrying out works will in no way impinge on the SSI. The main contractor is part way through investigations dealing with surface water in a way which will be satisfactory to all parties. Detailed consideration will be given to the Main Contractors proposals for a cheap and satisfactory protection to the site, at the appropriate time, and agreed with all interested parties."

Again, it is hard not to conclude that it was the SSSI that was at the forefront of everyone's thinking, rather than the more mundane considerations of managing the interaction of the groundwater and the buildings on this site.

54. The reference to the possibility of putting the surface water (i.e. the rainwater from the roofs of the new buildings) into the canal is picked up later in this narrative at paragraph 68 below. That is different to the groundwater drainage system, which was the subject of the Landcare report.

55. The excavations started on site in about November 1994. It was common ground that these were extensive works of cut and fill, in order to allow the sloping site to accommodate the terracing necessary for the accommodation blocks. Mr Webb's Project Status Report Number 3, dated 3 November, referred again to the mineshafts and said that "investigations are to be progressed after earth moving operations to determine the existence of the former mine workings and to identify any necessary remedial works."

56. During the excavation works, there were considerable problems with water. These gave rise to what I have called Drainage Event 1, explored in greater detail in **Section 4.4.2** below.

4.4 The Construction Works

4.4.1 The Drainage Design/General

57. There is no evidence that anyone considered the options to deal with the groundwater which had been identified by Landcare, or that anyone sat down and worked out a proactive groundwater drainage strategy for this site. On the contrary, as set out in the remainder of this **Section 4**, the evidence demonstrated that every element of the groundwater drainage design on this site was reactive, and the direct consequence of a particular problem with water that arose during the excavation and construction works.

58. In addressing the issue of groundwater drainage design, the experts (and therefore the parties and the court) have been hampered by the absence of proper or comprehensive drawings. But it is not right, as Mr Hickey sought to argue, that this was because the works were carried out a long time ago so the records were necessarily incomplete. Save for one drawing which has not survived (paragraph 85 below), I am confident that all the principal drawings relating to the drainage design have been retained. The problem is that they contain almost no detail at all, and where they do, the details are often wrong. In my view, the absence of proper drawings is consistent with the fact that the groundwater drainage design was produced on an ad hoc, reactive basis, with no one person in control of that design. Particular design decisions were taken solely to deal with specific problems that had arisen on parts of the site. There was no overview. In those circumstances, it is easy to understand why the drawings are deficient.

59. In **Sections 4.4.2-4.4.5** below, I deal with the design of the groundwater drainage by reference to the four separate events which triggered the particular elements of that design. At the same time, I also note some of the contemporaneous construction records relevant to other disputes in the case. Thereafter, in **Section 4.4.6**, I deal with the drainage on the eastern side of Building F1/F2, on the bank leading down to the canal, an area in respect of which there were almost no contemporaneous records at all.

4.4.2 Drainage Event 1: The Water Problem in the North East Corner

60. On 19 January 1995, during the excavation in the area of Block F2, the Clerk of Works, Mr Hodgetts, recorded that:

> "The spring water from the site routed through the excavated area instead of through the wooded area to the north. This started to discolour the canal water. As soon as the contractor was aware of this, temporary drains were set and the problem was resolved."

The note makes plain that water was already flowing down across the site where the F1/F2 Building was going to be built.

61. Mr Franklin, the University's drainage expert, said that the "temporary drains" referred to by the Clerk of Works were two 100 millimetre diameter pipes which were installed just beyond the north east corner of the F1/F2 Building. They became permanent elements of the design and remained on site. It appears that this was the first element of the groundwater design: as Mr Franklin agreed, there did not seem to be any drawings showing any groundwater drainage design at this time. I note that this element of the design was never set out in any record drawing.

62. The installation of these pipes was not an unqualified success. In the minutes of the meeting of 23 March 1995, MCL noted this groundwater was "running around a half bore" and MCL were "concerned that a new watercourse will be formed".

63. Also during early 1995, when the excavation works were being completed, there were references in the contemporaneous documents to a (yet further) proposal to locate the

two mine shafts. Many of these notes refer to a future intention to investigate, and there are no details of what was actually done:

(a) The minutes of the meeting on 27 January 1995 noted that everyone was "awaiting results of further probing for the position of the two mineshafts which are expected to be in the location of F1/F2";

(b) Mr Hodgetts' notes for the week ending 29 January 1995 recorded that "investigation to find old mineshafts is to start next week";

(c) The minutes of the meeting on 9 February 1995 recorded that the "F1 and F2 shafts not yet located". Later in the meeting, Curtins reported that "there had been no sign of pits in the F1/F2 area but that further investigations were continuing to see if these had been backfilled".

64. As noted in paragraphs in 36 and 43 above, SSL had expressly raised in their report the question of the sulphate content of the water and the potential damage that it might do. On 17 February, Mr Webb wrote to MCL following an inspection of site C (the part of the development on the opposite bank of the canal to the F1/F2 Building). He noted substantial evidence of black ash and red shale within the excavations and was concerned about the sulphate content of the ground. He told MCL that he was aware that the SSL report had shown that the sulphates were class 1 to BRE Digest 363 and that the concrete specified was therefore adequate. However, he sought further confirmation and asked "what precautions are being taken to protect the concrete surrounds to drains and the sub-structure masonry up to damp proof course level?" Of course, in the light of what was to happen to Building F1/F2, this was a remarkably prescient enquiry.

65. At the meeting on 23 February 1995, Mr Webb's letter prompted a discussion about sulphates. MCL confirmed that the investigations showed Class 1 sulphate "and precautions had been taken against this". It is not clear what these were. The same minutes also record that no evidence had been obtained in respect of mineshafts F1/F2, and recorded that it appeared "that any original mineshafts had been quarried and backfilled". It is not clear where this information came from: as noted in paragraph 19 above, the only evidence of quarrying on this site is the Turner painting dating from 1824.

66. In his Project Status Report Number 5 dated 27 February 1995, Mr Webb noted, under the heading 'Mineshafts', that "extensive investigations have revealed no more shafts in the vicinity of F1/F2, although coal seams have been identified. He repeated the information that the investigations showed that the site was quarried and backfilled. Curtins were designing the sub-structure accordingly". There are no records of the investigations carried out. There is nothing to say how the conclusion was reached that the site had been quarried and backfilled or when it was said that had happened. There is also nothing to indicate where the coal seams were that had been identified. Again, the absence of any such records suggests that this aspect of the works was not perhaps pursued as rigorously as it ought to have been.

67. Project Status Report No 5 also recorded that, in respect of surface water drainage for the site on the western bank of the canal (where the F1/F2 Building was located), MCL were finalising a survey and that by the next meeting "a drawing will be

produced to show the drainage and the status quo". This related back to the proposal to seek permission to discharge surface water into the canal (see paragraph 54 above).

68. Mr Hickey took us to this, and a number of other references in the documents, which indicated that, at this time, MCL had a proposal to discharge the surface water (that is to say, the water that fell on the roofs of the new buildings, ran down drainpipes, and was collected in manholes) into the canal. However, the absence of any permission from any of the parties interested in the SSSI, the absence of any detailed design showing this proposal, and the absence of any sub-surface drainage actually built to achieve this end, make it much more likely than not that this permission was not granted, and/or that a different design solution was adopted. There is nothing in Mr Webb's reports or the minutes of the meetings with MCL to suggest that their proposal had anything whatsoever to do with groundwater drainage.

69. On 10 March, DCA wrote to Curtins to point out that "no allowance has been made for water arising from springs which are known to discharge on this site". That was true: as I have noted, there was at this stage no design for any drainage dealing with the groundwater, a surprising omission given the numerous recorded instances of water on the site. When Curtins replied to DCA on 14 March they did not deny that suggestion either. All they said was that it was their understanding that "any springs arising on the site will be located by the contractor and diverted into the canal to maintain the status quo". In other words, they were saying that this was a matter for MCL, not them, and that what mattered was the status quo (for SSSI purposes). This again emphasised the lack of an overall drainage strategy; the highest that it could be put was that MCL would deal with any springs, if and when it had located them.

70. In any event, Curtins' 'understanding' (that springs would be dealt with as part of the surface water drainage proposals) appears to have been mistaken. It was not what MCL said they were proposing when they were discussing run-off with those responsible for the SSSI. Their proposal was limited to surface water drainage only. Moreover, any plan to put the groundwater drainage into the canal, as well as the surface water, would not only have been a radical departure from MCL's original proposal, but would also have required a close analysis of the nature of the groundwater to be allowed into the canal. It made the risk of contamination (from the mineshafts, if nothing else) much more acute. I also note that this was the first and last reference by Curtins to any such notion. The absence of any further references by Curtins to this possibility strongly indicates that their understanding was wrong. Since it was MCL who were responsible for the drainage now, not Curtins, I find that that is the most likely explanation.

4.4.3 Drainage Event 2: The 'New Springs' To The West of Building F1/F2

71. The second set of groundwater problems during the works occurred in April 1995. At the site meeting on 27 April, MCL said that they "had identified new springs adjacent to buildings F1 and F2 and all land drains were to be installed". The location of the water and the land drains was to the west of the F1/F2 Building at the changing level where a crib-lock wall (a type of retaining wall) was being built as part of the terracing. This was on or close to the line of the old watercourse.

72. The minutes of the meeting of 18 May confirmed that new springs had been found there and that land drains were being installed. The minutes of 1 June provide more

detail. It was noted that spring water was issuing in the retaining wall and car park area to the west of the F1/F2 Building, and that land drains laid with 100x50 hardcore on terram were being installed. Mr Franklin agreed that MCL were reacting to the spring water by having land drains installed at the foot of the retaining wall.

73. The report attached to the minutes of the meeting on 13 July 1995 suggests that these land drain works may not have been successful. The report notes that "spring water was issuing at the base of the crib-wall" and that as a result a land drain was laid and connected to the existing system. Mr Franklin said this might have been another crib-lock wall. There is no record either way.

74. Accordingly, by the summer of 1995, only two elements of ground water drainage had been designed and installed: the two pipes in the northeast corner (paragraphs 60-62 above) and the land drain at the base of the crib-lock wall (paragraph 72 above). Both of these elements of groundwater drainage had been designed and installed solely because of the ongoing water problems encountered during the construction works. They were reactive solutions.

4.4.4 Drainage Event 3: The Spring Water

75. In May 1995, Curtins produced their amended drainage drawing, 14324/DR2 revision D (in its later version of Revision E, this is at ***Figure 1***). Rev D showed a land drain on the west side of the building, which may well be the drain referred to in paragraph 72 above. That is important because it indicates that the Curtins' drawing was intended to show groundwater drainage where it had been designed. The problem is that, for Building F1/F2, this land drain is the only element of groundwater drainage design shown on the drawing.

76. The drawing also showed a surface water drainage system on the eastern side of the building, indicating that the rainwater on the roof of the F1/F2 Building would run down drainpipes to ground level and then would collect in a drain run running downhill from manhole S31 in the northeast corner of the building to S32 in the southeast corner of the building, and then away from the canal to a pumping station. There are two points to be made about this. First, it supports my earlier conclusion, that by May 1995 (the date of Rev D), MCL's proposal to put the surface water into the canal had come to nothing, with the drawing now setting out an entirely different solution. And secondly, as explained in greater detail below, this surface water drainage system was never built, despite the fact that, a year later, this same drawing was reissued as Rev E, recording the as-built drainage system.

77. On 1 November 1995, at a time when the piling, pilecaps and ground works had been completed, a new and significant water problem arose on site, noted in the minutes of the meeting on 2 November 1995 as "Spring Water F1/F2". The minute went on to say that this water was "to be piped through – all water to be brushed out of foundations prior to progressing".

78. An explanation for this piping solution can be found in DCA's letter to MCL of 6 November. This letter referred back to their site visit on 1 November and said:

> "It was observed that springs issued from the bank immediately adjacent to building F1/F2. These had partially flooded the

> excavations for ground beams and had resulted in mud being deposited on blinding surfaces. It is confirmed that you [MCL] intend to divert the water and clean the excavations and blinding prior to laying steel."

79. Mr Franklin confirmed in cross-examination that this indicated that the land drain work that had been done the previous April had not worked and that the water flow was exceeding the capacity of whatever it was that had been put in to deal with the groundwater. He said that it meant that either the existing drainage did not have sufficient capacity or it was incomplete. He also agreed that it was possible that the water was at a deeper level and had therefore not been caught by either the crib-lock wall or land drain that had been installed. He agreed that MCL were now having to readdress the drainage design because the current design could not cope with the water.

80. This was the start of a period of 4 months (November-December 1995, January-February 1996) when there were persistent problems of spring water in the footprint of the F1/F2 Building as it was being constructed. It appears from the records that MCL had the greatest difficulty in dealing with that water:

(a) The minutes of the meeting of 16 November 1995 repeat that spring water at building F1/F2 was "to be piped through";

(b) The minutes of the meeting on 30 November 1995 referred to the spring water at building F1/F2 and said that "water removal was ongoing". Precisely the same note can be seen in the minutes of the meeting on 14 December 1995;

(c) At the site meeting on 11 January 1996 it was again recorded that water removal was ongoing and this time there was an additional note that "MCL to consider alternative proposals". The plain inference from this and the other documents is that MCL were at a loss to know how to deal with this ongoing water problem.

81. Mr Hodgetts, the clerk of works, was plainly becoming frustrated. On 17 January, he noted that Robin Peters of Peters Associates (who had taken over the role of DCA on behalf of the University) had visited the site and had inspected the foundations of F2. Mr Hodgetts went on:

> "I pointed out the amount of water retained between the ground beams, particularly the northeast corner (up to the top of the ground beams)"

In consequence of this, Peters Associates wrote to MCL on 17 January 1996 specifically about this problem. They said:

> "The units exist at the low point of the site in an area of active springs. The water is becoming trapped within the internal perimeter of the ground beams. Our concern is the likely long term corrosion effects from an excessively wet atmosphere beneath the Bison Wide slab units forming the suspended ground floor.

> Whilst some backfilling is planned, we feel this should extend to a level of say 300mm of granular material above the ground beams with the provision of land drains leading through the building substructure. This would enable the natural ground water to in turn flow to the adjacent canal. As a further refinement of this observation a concrete blinded horizontal DPC immediately over this internal backfill would also contribute to the improvement of this problem…
>
> The writer would welcome any further views as to the present situation which we consider is unacceptable as regards to long term performance of these units."

82. The installation of 3 or 4 blue pipes through the blockwork of the eastern wall of the F1/F2 Building, below the suspended ground floor slab, together with some form of drainage blanket, was subsequently carried out by MCL. Thus, on the face of it, this third element of the drainage design was not only entirely reactive to the ongoing water problems on site (as the previous two elements of the drainage design had been), but it was devised by Peters Associates (who were advising the University and had no contractual responsibility for the design of the drainage) in the space of a few hours. Neither Peters Associates, nor anyone else, had worked out the depth of the groundwater on site, which was a key recommendation of the Landcare report.

83. Mr Hickey drew the court's attention to the fact that the Peters Associates' letter talked about the natural groundwater "in turn flow[ing] to the adjacent canal". But, as previously noted, there had never been a formal proposal for the groundwater (as opposed to the storm water) to go into the canal, and such a proposal would have faced enormous difficulties because of the SSSI. It appears that this sentence was based on a misunderstanding (perhaps because of the Curtins' letter noted in paragraphs 69-70 above). That is confirmed by the absence of any drainage, whether as designed or as built, that deliberately took the groundwater into the canal.

84. Things got worse before they got better. In Mr Webb's project status report number 13, dated 24 January 1996, he referred expressly to the spring water at F1/F2 and described it as "welling up within the foundations of F1 and F2." He went on to refer to the blue pipes and said that "Morrisons, Curtins and Peters Associates have agreed a method of allowing water to pass through the building, without affecting structure". This was a reference to the quick solution devised by Peters Associates. The problem was also referred to in MCL's report of 8 February 1996 as "issues under solem", the solem being the level beneath the suspended floor. The proposals referred to were "porous drains, granular filled DPM and capping". Mr Franklin agreed that these notes confirmed that water was coming up from the subsurface beneath the F1/F2 Building.

85. On 8 February 1996, at the next site progress meeting, there was a reference to the MCL report of the same date. It was noted that the report "showed the problems with the watercourse under F1/F2 where additional work is required." Although the use of the same word was doubtless inadvertent, it appears that the spring water problems now being recorded by MCL were in the location of the watercourse referred to on the O/S maps (**Section 3.2** above). At the same meeting, there was a reference to the agreed solution and a reference to a drawing received by Mr Hodgetts. That drawing

(which presumably showed the drainage blanket and the blue pipes that were later discovered when the investigations were carried out post-cracking) has been lost.

86. In the project status report of 22 February 1996, there was another reference to spring water "welling up within the foundations". There is a reference to the agreed methodology and it is said that these works were in progress. However, it does not appear that, even then, the problems were resolved. In his note of 1 March 1996, Mr Hodgetts said:

> "Spoke with MCL about spring water to the west elevation to block F1/F2 which has built up that much that it is running through the cavity of the partition wall between the two blocks (like a stream). They said that they would lay land drains around the buildings to solve the problem. I thought it ought to have been completed weeks ago to minimise any damage that may be caused."

4.4.5 Drainage Event 4: Further/Deeper Land and Field Drains

87. As noted in the previous paragraph, MCL's solution to the ongoing water problems was to build further land drains. It is not known whether this work was carried out, and if so how, because they are not shown on any drawing or recorded in any other document. Similarly, when at the meeting of 7 March 1996, it was recorded that "there were further water problems in and around F1/F2 and that a larger and deeper field drain was required around the building", it is not clear what precisely was proposed or, indeed, whether the work was ever carried out. The fact that a deeper land drain was proposed again reveals that Landcare had been right to emphasise at the outset the importance of calculating the depth of water on site, and the baleful consequences of not doing so. It was suggested to Mr Franklin that, if the drainage designers had looked at the depth of the water on site in the first place, as Landcare had suggested, they might have got it right first time. He agreed with that.

88. In the same minutes, it is noted that MCL were to consider the requirements of English Nature and the SSSI "when designing the land drain discharge". That does not make it clear whether it was proposed that the discharge was going to go into the canal or whether, because of the requirements of English Nature and the SSSI, the water would definitely *not* discharge into the canal. No proposals were formulated either way and, on the basis of the documents available, it appears that the topic fizzled out.

89. By 10 March 1996, Mr Hodgetts noted that the water problem had been "partially resolved" but added that the permanent solution was not yet completed. The minutes of the meeting at 4 April 1996 said that "land drainage system was being installed". There was also a reference in another part of the same minutes to "additional land drains have been installed".

90. This fourth event, and the fourth element of the drainage design, namely the bigger/deeper land drain, was also not an unqualified success. Mr Hodgetts' report of the week ending 23 June 1996 records that "more spring water control has become necessary to the abutment area of the link bridge to block F2 entrance". He said that

works in that areas were ongoing. By this stage, the undercroft and much of the super-structure of the F1/F2 Building had been completed.

4.4.6 The Land Drainage to the Eastern Side of Building F1/F2

91. So far I have identified the four elements of the groundwater drainage design whose genesis was recorded in the contemporaneous documents. Each of those four elements was not the result of a proactive drainage design, but was instead the result of water problems encountered during excavation and construction. Each of these elements, namely the pipes in the northeast corner of the site beyond that corner of the F1/F2 Building, the blue pipes through the blockwork, and the land drains at least to the west of the building, were all subsequently seen on site after December 2011.

92. But what has proved far more problematic has been the drainage that was designed and/or built on the eastern side of the F1/F2 Building, in the bank between the eastern wall and the canal. The drainage arrangements there matter because it is an element of the analysis put forward on behalf of the defendant by Mr Corrigan, their drainage expert, that some of the water subsequently found in the undercroft, hard up against the inner leaf of the eastern elevation blockwork, had backed up from the waterlogged ground beyond that wall. It is therefore sensible to set out here my findings in relation to this part of the site.

93. As recorded in the Curtins' drawing 14324/DR2 Revision E (***Figure 1***), there were no land drains or groundwater drains in this area at all. What the drawing did show was a system for dispersing the surface water run-off from the roof (see paragraph 76 above). It showed two manholes, S31 and S32 at either end of the eastern wall of the F1/F2 Building, linked by a pipe run. It appears that the water was intended to pass down the pipe in a southerly direction, from S31 to S32. It then went west, away from the canal, into manhole S34 in the south western corner of the building, before going on to a pumping station. Mr Corrigan's first report was highly critical of that design because he said that the schedule of levels and other information available to him demonstrated that it required the water to flow uphill (which he said would not happen). Surprisingly perhaps, Mr Franklin did not address this topic at all in his report, telling me that he was content simply to put Mr Corrigan to proof of what he said.

94. As a result of investigations just a month before the trial (explained in greater detail in **Section 5.7** below), it became apparent that manhole S32 did not exist at all. In addition, manholes S31 and S34 could not be located, and so they may well not exist either. It appeared that all that had been installed from the Curtins' drawing was a pipe running parallel to the eastern wall of the building. That pipe was perforated, and can be seen in some of the photographs. The blue pipes through the blockwork (Drainage Event 3, described in **Section 4.4.4** above) were connected to this pipe.

95. Following these further investigations, it was Mr Corrigan's conclusion that, because the perforated pipe was not attached to anything, what had been installed was a kind of soakaway: a perforated pipe which allowed water to disperse into the ground along its length. That pipe was not apparently connected up to any manhole and was not part of any proper system of groundwater drainage. This conclusion was consistent with his view that the ground on the eastern side of the building was waterlogged, which helped to allow the water to be impounded in the undercroft.

96. Further support for the conclusion that the drainage in this area consisted of no more than a type of soakaway can be found in the fact that, as explained in greater detail in paragraph 106 below, the post-cracking investigations revealed the existence of a manhole full of water just beyond the north-east corner of the F1/F2 Building. When that manhole was emptied, it was found to contain no outlet pipe. It was referred to by the University's then engineering advisors, BJB, as a "soakaway": because the manhole had no outlet, when it was full it overflowed, and the water soaked away into the surrounding ground. Mr Foster, the University's maintenance manager who was there when it was uncovered, also said that the manhole was surcharged and not working.

97. As to the manhole, it was the University's case that BJB were somehow mistaken about the absence of an outlet from the manhole. Mr Franklin, who never even saw the manhole, asserted that there was an outlet, apparently on the basis that it would have been stupid not to provide one. Given the other deficiencies in the design of the groundwater drainage on this site, I did not find that a persuasive argument. There was nothing which would allow me to say that the engineer (Mr Basray of BJB), who saw the manhole, was wrong to say that there was no outlet, and that the engineer who did not see it could give better evidence about what was there. I therefore find that the manhole was performing a similar function to a soakaway.

98. Similarly, I reject the University's case that the perforated brown pipe was not a soakaway but instead led to an engineered outfall, allowing the groundwater to run into the canal. There are a number of reasons for that. First, there was no drawing or indication in any document that such an outfall had ever been designed or built. Secondly, there is no evidence that, if it had been designed, it had ever been approved. I accept that, in 1994 and into 1995, MCL were involved in negotiations with English Nature and the British Waterways Board, that they be permitted to put surface water (i.e. the rain collected on the roofs of the new buildings) into the canal: see paragraph 68 above. However, these negotiations never gave rise to a concluded agreement or permission to allow MCL to do that. Because of the sensitivity of the SSSI, it is inconceivable that, had such permission been granted, it would not have been the subject of a clear written notice to that effect. There is no such document.

99. Furthermore, as I emphasised during the trial, those negotiations related to surface water (i.e. rainwater). There is no indication that those discussions ever involved groundwater, which is of course a completely different type of water and much more likely to contain contaminants (and therefore much more likely to be a threat to the SSSI). It is simply implausible that MCL designed and built a groundwater drainage scheme that took the groundwater into the canal, in circumstances where such a scheme was not the subject of any design drawings; was not the subject of any approvals or consent; and (as explained in the next paragraph) could not be found on site.

100. No such engineered outfall was identified by Arup in their detailed investigations referred to in **Section 5** below. The existence of such an outfall was never even suggested by anyone until after the investigations in early February of this year. Still further, there was no evidence of any such outfall on site. Mr Franklin was asked whether there was any such evidence, and he agreed that there was not. That was also Mr Corrigan's view, who pointed out that, to cope with the flows, such an outfall would have had to have been huge: had it existed, it would therefore have been found.

The best that anyone could do was to identify a photograph from 2012 of some gravel somewhere down the slope in the middle of the eastern elevation (for example, the photograph at page 3164 of the bundle). But Mr Franklin did not say that this was an engineered outfall, and when that notion was put to Mr Corrigan, he denied that it was an outfall and explained that, if it had been, Arup would have said so, and would also have tried to use it for their remedial drainage scheme.

101. This is a convenient place to deal with a point made by Mr Hickey during the evidence and in his closing submissions. He relied on the absence of any records, after 1996, which indicated that the ground beneath the F1/F2 Building, or the ground around it, was waterlogged. On analysis, however, this point is not as good as it might first appear. First, there is no evidence that anyone ever went underneath the F1/F2 Building to inspect the undercroft (the lack of proper inspection facilities being another criticism of the design), and we know from the staining that the water was impounded there for long periods. Secondly, as for the bank to the east and north of the F1/F2 Building, access to that was difficult and the area was in any event partially overgrown. It was known to be wet and marshy; it was where the reeds grew which were the subject of the SSSI. No one would have any reason specifically to inspect that land, or to conclude that it was particularly wet. Thirdly, I do not accept that Mr Foster's evidence indicated that this ground was always dry: his records did not say that, and he himself was not in a position to know, one way or the other.

102. Accordingly, taking all that evidence into account, I make the following findings in respect of the surface water/groundwater drainage on the eastern side of the F1/F2 Building:

(a) The surface water collection system designed by Curtins was not built;

(b) There were no effective surface water manholes on the eastern side of the F1/F2 Building;

(c) The rainwater downpipes discharged either into the brown pipe referred to below, or straight into the ground;

(d) The manhole that was subsequently found on that side of the F1/F2 Building was correctly described by the University's then engineers in 2012 as a soakaway;

(e) There was a brown pipe running north/south, parallel to the eastern wall, into which the blue pipes through the blockwork connected (Drainage Event 3). That pipe was perforated which allowed the water within it to soak away into the ground.

(f) There was no engineered outfall into the canal for surface water and/or groundwater drainage, whether designed and/or permitted and/or built.

5. THE EVENTS OF 13 DECEMBER 2011 AND THEREAFTER

5.1 The Cracking

103. During the night of 13 December 2011, significant cracks appeared inside Building F1/F2. The cracks were generally (but not exclusively) along the junctions between ceilings and walls on the inside of the F1/F2 Building on the eastern side. There were no cracks or obvious signs of damage to the external wall.

104. Because of the extent of the internal cracking, the University wisely took the precaution of evacuating the entirety of the F1/F2 Building. Investigations were then carried out which stretched out over a period of many months, well into 2012. Towards the end of that year, on advice, the decision was taken to demolish the F1/F2 Building. Demolition occurred in about November 2012.

5.2 Initial Investigations

105. The University alerted the defendant insurers immediately. The contemporaneous note made by the defendant's claims handler, Mr Neave, dated 14 December 2011, is the first contemporaneous record of the cracking. He records that "there is definite ongoing movement" and that the F1/F2 Building was of pile and beam construction "and shouldn't be moving". He recorded that the loss adjuster's initial observations were that the probable causes were a design/construction defect in respect of the piling, subsidence as a result of an escape of water from defective drainage, or movement as a result of a new spring. In connection with this last possibility, Mr Neave noted that "the area is well known for springs". His note said that the value of the claim on a worst case scenario was between £3.8 million and £5 million and went on to say that "this number is very unlikely to be realised and I expect the claim will end up being repudiated, although it is early in the process."

106. The University first appointed as consultants BJB Consulting LLP ("BJB"), whose principal was Mr Basil Basray, a structural engineer. On 18 December 2011, he reported from his visual inspection. Amongst other things, he referred to the manhole just beyond the north eastern corner of the building. He said:

> "A surface water manhole was also located at the rear elevation (facing the canal) which matched the original drawings located at the head of the run. The cover was removed and the manhole was found to be completely full of surface water. During the course of Thursday's inspection, this manhole was emptied and was found to be a soakaway with no outlet pipework. This is clearly contrary to the information on the as-built drawings and it appears that surface water was not constructed to the original intent/design."

That passage is the basis for my finding at paragraph 97 above that the existence of the manhole without any outlet, which Mr Basray described as a soakaway, is consistent with the conclusion that all of the drainage on the east side of the building was designed as a kind of a soakaway, and was not connected to any proper outfall system.

107. Mr Basray went on to say:

> "At the time of this inspection, there was also evidence of ground water flowing from the side of the bank at a location

> immediately in line with the worst area of the current building settlement. This area of ground was excavated and revealed a layer of single size gravel with ground water flowing constantly. The rate of flow of the water remained constant during out third inspection carried out on Thursday afternoon. We suspect that this may be spring water as the site is known to have historical springs in this location."

This was one of the first of many references to the spring water flowing under/ through the F1/F2 Building in the area where the worst of the damage to the blockwork occurred.

108. On 20 December 2011, Mr Hession, the loss adjuster appointed by Mr Neave, produced a preliminary report. He confirmed that "running water was observed immediately adjacent to the area of movement which appeared to be a spring. The spring was free-flowing and appeared to be natural but this was being investigated further." The report went on, under the heading 'Cause':

> "The cause is yet to be established. Site investigations are ongoing and these investigations should provide a clear indication of the mechanism of failure. There are a number of potential causes being considered at present which include lubrication of piles (reducing or eliminating skin friction element of the pile design) resulting in failure of the piles. Erosion of soil as a result of an escape of water from pipework or ground water which has been seen from the spring or a failure in the design or construction of the building. These are not exhaustive of potential causes considered and investigation should confirm causation in due course…"

109. In addition to Mr Hession, the engineering firm of Byrom Clark Roberts ("BCR") were engaged to advise the defendant. The relevant engineer at BCR was Mr Gooud. His file note of 20 December 2011 indicated that he had reviewed the O/S maps which, he said, suggested "that there are drains and possibly springs in the area, again these may be old wells".

110. On 6 January 2012, Mr Gooud provided a more detailed report for Mr Hession. In that report he correctly identified the problem as being the downward movement "due to the failure of the internal block leaf in the subfloor void". Under a heading of 'Slope Stability/Ground Conditions', he said:

> "We are aware that the property is built on a sloping site and that there is evidence of springs which were noted on old maps. We also noted a spring to the rear of the property and trees in close proximity to the rear elevation. If the property has been built on a pile foundation this should have overcome any issues relating to trees, springs and any defective ground conditions…"

He recommended that a number of further investigations be carried out. These included a review of the as-built drawings and tests on the chemical composition of the water.

111. On 9 January 2012, Mr Gooud emailed Mr Hession to say that the whole 13 metre length of the inner leaf had dropped. He said he would like to see the whole of the blockwork below the floor, because he was sure – correctly, as it turned out - that this would provide the answer to the question as to what had caused the damage. He thought the whole of the affected area needed to be demolished: it was impossible to prop as it was too unsafe.

112. This email coincided with a further report from BJB, with photographs of the undercroft behind the inner leaf blockwork. These revealed standing water present at a significant depth, which was trapped behind the external wall. BJB recorded that the existing blockwork was "completely saturated" due to the presence of the standing water. BJB said that, because the cracking was continuing to worsen, they suspected that the excessive presence of ground water "may be the single cause of this damage" and raised the spectre, for the first time, that the existing building "may not be recoverable".

113. On 11 January 2012, Mr Gooud commented on the further report from BJB. In dealing with the blockwork wall, he said that the weep holes were only 12-15mm in diameter and were blocked. It is clear from his report that, at this time, he was unaware (because the ground had not yet been dug out) that there were some drainage outlets through the wall. Thus Mr Gooud was saying that the ground water was trapped within the undercroft because the weep holes were inadequate. He said a simple drainage system would have remedied that.

114. Mr Gooud also said that it was not a surprise that the ground conditions were found to be poor because that was well known in the area. He said that he suspected that the water had been in the void "for many years" and that the natural springs had also been present for many years. He was uncertain whether or not the site hydrology had changed. He reiterated the point that what was required was "an adequate drainage system from the base of the subfloor void in the form of 75mm diameter weep holes" (by which he meant pipes through the wall, from the undercroft into the bank on the eastern side).

115. On 13 January 2012, there was a meeting between the defendant and its advisors and the University's representatives. BJB said that the building failure was triggered by spring water and that there had been no change in the water, confirming that there had always been water 'on and through the site'. Mr Hession said that he had advised the defendant that the cause was likely to be water and that he would be producing a note of the discussion.

116. That note took the form of an email to Mr Neave dated later on 13 January 2012. That referred to the Wikipedia entry, referenced at paragraph 21 of this Judgment. Mr Hession referred to the suggestion by BJB that a mat of stone had been constructed across the site and that water was allowed to freely pass through and under the F1/F2 Building, and said:

> "I am not sure that the designer statement above supports this conclusion or that it is a likely solution adopted. I did however challenge BJB in this respect and advised that if this was the case, and although there is a subfloor void beneath the building, why were the weep holes (which incidentally are blocked i.e. not maintained) so inadequate. BJB confirmed their agreement that the weep holes were under designed and inadequate."

There was also a reference to how long the water had been in the void. BJB had said at the meeting that it could possibly have been present for 10 years. This led on to a discussion as to whether that could have resulted in a reduction in the compressive strength of the submerged blocks or mortar.

117. Mr Hession emailed Mr Gooud on the same day, saying that "we do need to consider tactics carefully". He said "I am beginning to believe that the ground water is the trigger but it is exposing design deficiency. What do you think?" Mr Hession was also critical of Mr Basray of BJB and was not confident that he had a good grip of the issues. Later that same day, Mr Hession emailed Mr Neave to say that the two potential causes of the damage were changes in the water level or defective design/construction. These possibilities were then explored in greater detail in his email.

118. On 17 January 2012, Mr Gooud replied to Mr Hession's email of 13 January. He said that he was unable to confirm that the causation had been due to a change in the water table. He said that the level of water in the subfloor void could have varied since it was constructed. He said he had not seen any evidence of a mat of stone and that what was on site did not allow free passage of water through or under the building. He reiterated his criticism of the lack of adequately designed drainage passing through the blockwork.

119. There was another meeting between the parties on 20 January 2012. Before that meeting, Mr Neave met with Mr Hession and Mr Gooud. At the pre-meeting it was agreed that it may be difficult to prove that there had been an appreciable change in the water table. They then discussed the issue of design. They agreed that, in order to consider inadequate design as a potential cause of damage, it would be necessary to consider what was reasonably known to the designers at the time of construction and consider that in conjunction with the prevailing standards at the time.

120. At the meeting with the University, it was suggested by the defendant's team that it might be in the best interests of the University to appoint Ove Arup, their panel engineers, rather than BJB. The University said at that stage they were happy to proceed with BJB. The short minutes suggested that Mr Neave said that the options still being pursued by the defendant were water table, design and construction. On the same day Mr Neave notified the defendant that "neither of the two most probable causes (change in the water table, design/construction defect) were covered under the policy" and went on to say that there was "a high probability that the claim will be repudiated". As a result, Mr Neave said that the defendant was not seeking to reserve.

121. It is appropriate to pause here to deal with an underlying theme of the University's case at trial, which was that Mr Neave and/or others involved in this claim on behalf of the defendant were not approaching the problem with an open mind and were

looking at every possible way to decline the claim. Reliance was placed (amongst other things) on the 'tactics' reference (paragraph 117 above) and the fact that Mr Neave was wrongly putting the onus on the University (paragraph 120 above). This line of attack reached its high watermark in Mr Hickey's written opening, when he accused Mr Neave of acting in bad faith. Since bad faith had not been pleaded, and there was therefore no witness statement from Mr Neave, I refused to allow Mr Hickey to pursue that allegation. Despite that ruling, a critical tone was maintained throughout Mr Hickey's cross-examination of Mr Hession. It is therefore a matter which I should address.

122. Having considered all the evidence, and the documents to which I have already referred, I reject any suggestion of predetermination or a closed mind on the part of Mr Neave, the defendant or its advisors. On the contrary, it seems to me that, throughout this period, the defendant's team was anxious to try and ascertain the real cause of the damage. In the early days, there were a number of potential causes in play. Some of the events were outside anyone's experience: indeed, one of the few areas of common ground was that, when the concrete blocks were subsequently investigated and tested, the extent of the damage to the blocks caused by the water was thought by everyone to be "extraordinary" and "staggering". In those circumstances, no criticism can attach to the defendant or its advisors for seeking to work through each of the potential causes of the problem. Moreover, it is inevitable that, during such a process, the defendant would have in mind the terms of the relevant exclusion clauses.

123. The next phase in the investigations saw the first involvement of Mr Nevill of Arup[5]. He organised the further exposure and opening up of the bottom of the eastern wall. According to his email of 15 February 2012 to Mr Gooud, a core hole was put through into the undercroft which allowed a lot of water to initially flood out. He noted that, by the end of the day, there was still a considerable flow of water coming out from under the eastern wall. He said "this looks like a steady state water flow". He went on to say that, with more access, they had been able to get their hands into the inner skin and that there were sections "where the inner blockwork has also disintegrated".

124. On 16 February, there was a meeting on site attended by, amongst others, Mr Nevill, Mr Gooud and Ms Holmes of the University. At that meeting it was recorded that they had found "two 75mm diameter drainage pipes which emanated from the subfloor void above the foundation level." Those were the blue pipes which can be seen in the photographs which pass through the relevant blockwork and into the sloping bank on the east side of the F1/F2 Building. At the meeting, the flooding from the subfloor void "was described as severe". Once the trial pits had been opened out more considerable amounts of water were noted coming through the void. Even at dusk the flow from the subfloor void "was consistent and strong".

125. Mr Gooud's note of the meeting recorded that the blockwork below the watermark "showed signs of deterioration (attack) by the water that had previously been at that level". The cause of that attack was either chemicals or the physical flow of the water through the blockwork, causing it to disintegrate. On that latter point he described the

[5] It appears that, contrary to their public stance, the University took on board the criticism of BJB and replaced them almost immediately.

flow as "really strong but steady". He also recorded the good news that a trial pit undertaken on the west side of the F1/F2 Building was "bone dry".

126. Mr Hickey suggested that because, prior to this opening up, Mr Gooud had been of the view that drainage pipes should have been installed through the eastern wall, the discovery that such pipes had in fact been installed meant that Mr Gooud now considered the design to be adequate. Mr Gooud rejected that suggestion in his oral evidence, and his contemporaneous notes confirm that that was not his view. So, by way of example, at paragraph 3.5 of his notes of the meeting on 16 February 2012, Mr Gooud noted "that the drainage system is inadequate and a more detailed drainage solution needs to be found for the building. Simon Nevill (Ove Arup) agreed". That conclusion was reached following the discovery of the blue pipes through the blockwork which had been insufficient to allow water to pass through without damaging the blockwork.

127. Mr Hession emailed Mr Neave on 15 February 2012 to record the degradation of the blockwork which had rendered them devoid of any structural strength. He said "this is a phenomenon never witnessed before". He followed this up with a report of his brief conversation with Mr Gooud after the meeting on 16 February. He advised Mr Neave that Arup were currently reserving their conclusion for the time being, "but their provisional discussions appear to be consistent with our own thoughts, that the cause of the movement to the structure is as a result of the deterioration/disintegration of the below ground blockwork and this is directly influenced by the presence of the water of site. This, as you know, has been our feeling for a considerable period".

128. On 20 February, Mr Gooud wrote formally to Mr Hession setting out the site investigation findings. He said that there was evidence of very significant damage to a blockwork course below ground level at the base of the 4 storey wall. He went on:

> "The pieces of block work could be brought out with one's hand and were best described as a soft to very soft stony soil with much infiltration of tree roots. The degree to which the block has disintegrated is, to put it mildly, staggering."

As to the drainage, he identified that the drainage weep holes were the blue 75mm pipes passing through the wall and said that the drainage "is full to capacity and not working."

129. As to causation, he recorded Arup's view that the cause of the degradation/dissolving/deterioration of the blockwork was linked to the presence of the groundwater. He said that a constituent of the groundwater e.g. sulphates, could have caused the cement which binds the block together to dissolve although it was too early to confirm this. He went on:

> "In addition the physical flow of the water through the blocks (possibly over 17 years) could have caused a dissolving of the cement. The flowing of the water seems to be consistent phenomena and has probably been occurring for many years (although it may have increased recently)."

He also referred to the existing drainage system being full and having insufficient capacity. He said:

> "This may not have been the case at the time of the original design but the amount of ground water may have increased leading to the over capacity issue. During the trial holes it was noted that the drains were full and the fact that this results in water retention in the subfloor void will be relevant to the causation issue i.e. the water can't get away."

130. The chemical tests were recorded by Mr Gooud in a file note dated 23 February 2012. The basic result was that the chemical tests were "normal". The pH levels were described as neutral. The water was described as "fairly clean".

5.3 The First Arup Report

131. The first Arup report was dated 28 February 2012. It is unnecessary for me to set it out in full. However, in the executive summary, important points that were made included the following:

(a) The extensive cracking occurred throughout the flats overlooking the canal in the middle section of the F1/F2 Building.

(b) No significant cracking was observed in the outer skin of stonework.

(c) In the affected section there was a course of the below ground level blockwork which had substantially disintegrated. There was a gritty fibrous organic mush left in place of the blockwork which could be readily pulled out by hand.

(d) Groundwater was observed in the undercroft against the perimeter [eastern] wall. Once this had been released there was a strong steady state flow of water running through the building down into the canal. Ground water was seen in all but two of the trial pits.

(e) There was a variable rate of deterioration in the blockwork around the whole building but it was most pronounced where the water flow was strongest.

(f) The cause of the cracking was identified as the disintegration and failure of the blockwork. However, it was said that what had caused the blockwork to disintegrate "has not yet been proven". One possible cause was noted as a form of sulphate attack.

132. This report was the first time that anybody had made the link between the watercourse shown on the O/S map (**Section 3.2** above) and the damage to the F1/F2 Building. At paragraph 5.1.4, Mr Nevill noted that the watercourse shown on the maps ran beneath the footprint of the F1/F2 Building. He went on:

> "*There are no details of how the stream water has been incorporated into the land drainage at the site.* However it is understood that dealing with ground and surface water was a key part of the Kirkstall Brewery Development considerations…water can currently be seen discharging from

> the top of the slope to the east of the building at roughly the location of the former stream. This suggests that water is flowing rapidly through the soil directly beneath the building footprint." (Emphasis supplied)

He went on to conclude at paragraph 6.3.4 that the rate of water flowing through the ground could be described as "at least mobile but more likely flowing" and that "it is likely that the water seen coming through the building is part of the remaining flow from the spring and the stream."

133. In section 8.4 of the report, entitled 'Causation', Mr Nevill said that "the damage has been caused by the disintegration and failure of the blockwork. This has allowed the wall and floors above to drop." He went on to say that the actual cause of the failure of the blocks and their disintegration to a mush "had not been proven although it appears to be a possible sulphate attack". He also said that such a chemical reaction between components of the block and the groundwater had occurred "over a significant passage of time."

5.4 March-May 2012

134. On 2 March 2012, Mr Nevill emailed the University to bring them up to date with the investigations that had been carried out in relation to drainage. This was the first indication that the Curtins' as-built drawing (Rev E) was erroneous, and he noted that many of the storm water manholes had not in fact been built. He then went on to deal with the drainage 'at the front of' the F1/F2 Building, which everyone has taken to mean the drainage on the east side (the subject of my findings in **Section 4.4.6** above). His email confirmed that the design shown on the Curtins' drawing was not built because it did not work "from a level perspective" (i.e. water was going up hill). He went on to say that he thought the design was adjusted on site "to put in the perforated pipe and then it was taken to the north east corner of Turner [F2] as a soakaway". All of that is consistent with my findings at **Section 4.4.6** above.

135. On 8 March 2012, Mr Gooud wrote to Mr Hession in respect of the first Arup report (**Section 5.3** above) and recorded his agreement with large parts of that report. In particular, Mr Gooud expressly noted that he agreed that the reason why the blockwork had disintegrated "is as a result of a chemical process brought on by the flowing spring water. Although the precise cause is not yet proven, Arup's believe it may be due to Thumasite sulphate attack. BCR have a different theory after discussion with the Concrete Block Association." Mr Gooud ended this email with these words:

> "The main causation issue is the flowing of spring water which is largely present under the rear wall to the right end of Turner House which has reacted with a constituent of the block work leading to its disintegration. *If there had been no flowing spring water through the blockwork the problem would not have occurred.*"

The highlighted words were expressly adopted by Mr Hickey in his opening. Whilst I consider that Mr Gooud's advice was entirely accurate, the question for the court is which party is assisted by that succinct summary of the cause of the damage.

136. There was a further meeting between the parties and their advisors on 12 March 2012 at which Mr Neave asked Arup various questions. In answer to a question as to whether the problem was associated with inadequate drainage, Mr Nevill said:

> "Some provision has been made to migrate water from the undercroft into a French drain to the external perimeter of the building using perforated pipes."

That note does not read as a ringing endorsement by Arup of the design adopted, which is unsurprising given that Mr Nevill had previously criticised it (see paragraph 126 above). Mr Gooud's own note of this exchange was that it was uncertain whether the drainage was connected to the French drains, but that it showed that the issue had been thought about and some provision made. No one could confirm whether or not this was satisfactory by reference to the current regulations.

137. There was an internal email at BCR dated 13 March 2012 which was discussing what might have been anticipated on this site. Mr Gooud's colleague, Mr Thompson, said:

> "Ground water flow from spring would be unusual beneath a building, the presence of a spring on a brewery site not so. Why was the spring not culverted, or contained/controlled? Would you build over a stream? Uncontrolled flowing ground water beneath a building could cause all sorts of problems, not least ground erosion."

Of course, Mr Thompson did not know that, before any construction works were carried out back in 1993, Landcare had expressly advised either the culverting of the springs or certainly their containment and control.

138. In early April 2012 it appears that the defendant notified Mr Hession and Mr Gooud of their decision to decline cover. Both men were therefore 'stood down'. However, no letter of declinature was at that stage sent to the University. Meanwhile, on 30 April, Arup produced their second report. Again, the author was Mr Nevill. He said that the extent of the mobile ground water was the key element and that it was the groundwater that was the likely source of the sulphate. He went on:

> "As the levels of sulphate in the water are low at approximately 25% of the normal trigger levels it is considered that over time with the constant replenishment of the sulphate through the water that the degradation of the block work has occurred.
>
> It is not possible to put a specific timeframe to the deterioration. However it is likely to be of the order of 10 years based on the petrographic examination."

The report then provided the detailed evidence on which these conclusions were reached. It appears that, by this stage, Mr Nevill had seen the Landcare report because he said that "drawings from the original development show that there was an awareness of a potential for sulphate attack. Measures are indicated on the drawing to address the issue and also to deal with water flows." Thus, he concluded that the

mechanism for the deterioration of the blockwork was sulphate attack from the highly mobile groundwater.

139. On 31 May 2012, the defendant declined insurance cover. The relevant parts of the declinature letter were as follows:

> "Essentially Ove Arup have concluded that the buildings have suffered damage through deterioration of the outer and inner skins of block work walling. They advise the block work has been subject to sulphate attack and that the likely source of the sulphate is the ground water present beneath the buildings which over time (estimated by Ove Arup to be in order of 10 years) has caused deterioration of the block work, effectively reducing it to a mush."

The exclusion clauses referred to thereafter included those concerned with gradual deterioration, faulty or defective design of materials, and contamination. The letter then went on:

> "The degradation of the block work is damage consisting of gradual deterioration by reason of the effect of waterborne sulphates and that the cracking of the walls is damage caused by the gradual deterioration of the block work. In view of the above [presumably a reference to the exclusion clauses] I regret to advise that the claim for the above damage has been declined."

5.5 Subsequent Events in 2012 and 2013

140. At some stage in the late summer/early autumn of 2012 the decision was taken to demolish the F1/F2 Building. That is not a subject with which I need to deal in this Judgment because, as noted above, all quantum issues (which would include any issue as to whether or not the F1/F2 Building should have been repaired rather than demolished) are to be referred to arbitration, if I give declarations on liability in favour of the University.

141. However, three points should be noted about the later Arup advice. The first is that the damage to the blockwork meant that Arup could not be certain that the F1/F2 Building could safely stand for a further year without demolition. That can be seen from a number of the Arup reports including the report of 28 February 2012, the notes of the meeting on 13 March 2012, the structural testing summary report of 30 April 2012 and, perhaps most important of all, Arup's letter to the University dated 13 June 2012. In that letter they wrestled with the question as to whether it was safe to leave the F1/F2 Building for another year prior to demolition. Arup said that they could not prove that the structure could be safely left, even for that period.

142. Secondly, the proposed demolition gave rise to some relevant exchanges about allowing the groundwater to flow into the canal (and therefore the potential effect on the SSSI). The complication was the ochreous water that had been found on site, which had caused the staining to the undercroft. This was obviously a concern to Arup. On 20 December 2012, Mr Nevill emailed the University describing this as a

second issue relevant to the potential structural failure to the F1/F2 Building. He referred to the reports available at the time of the original development which identified the two mineshafts close to the site of the proposed F1/F2 Building. He went on:

> "As we saw on site this morning the northern end of Turner is very wet and water is a bright orange colour. This is indicative of the oxidation of Pyrite, Iron Sulphide, as it oxidises to Iron Oxide. A by-product of the reaction is Sulphuric Acid and it appears that has eroded the block work in the area as demonstrated by the acid etching seen on site…
>
> Attached are couple of photographs taken last week that show the disintegration of the block work in this area of the site. The disintegration of the block work will have reduced its load bearing capacity and that will explain the apparent movement and continued cracking that we all witnessed early this year in the end section of the Turner building…
>
> Based on the information from Gill's operatives there appears to be two locations where the water is coming to the surface and these are located on the car park side of the building. It is likely therefore that these are potential locations of the shafts and the mine water has come up via the shaft."

143. Thirdly, Mr Nevill's email of 20 December is also important because it confirms his view about the relevance of the old watercourse. He was now in a position to provide plans which, as he put it, "clearly show the location of the stream running down the canal and that is located exactly where we are currently seeing the water flow. It is also the location of the original damage." The Arup drawing showing the original watercourse, overlaid with a footprint of the building and the location of the damage to the block work, demonstrated why Mr Nevill was so concerned about this finding. The old watercourse matched the site of the subsequent damage and the flow that could be seen on site. The relevant drawing is attached to this Judgment as ***Figure 2***.

144. On the subject of the ochreous water, in an email to Natural England, dated 16 January, Mr Nevill's colleague Mr Wardman, referred to the significant quantities of ochreous water trapped in the undercoft. He said:

> "We constructed a sump during the demolition to trap the water flowing from under the building which was connected to a drain. However the water has now found its way through the ground and discharging down the canal bank to the canal through the SSSI."

This was obviously a serious development. It would again appear to show that Arup had connected the flow of water into a drain, confidently imagining that that would take the water away from the canal (as shown on the Curtins' drawing Rev E), but that instead the water appeared to flow into the ground and thus into the canal. That is again further support for the conclusions set out in **Section 4.4.6** above, that the actual drainage in that area was a kind of soakaway and nothing more.

145. Arup's twin concerns of this period were summarised in their memorandum of 29 January 2013. That recorded that there were two sources of groundwater issuing onto the site and finding its way into the canal below. One was spring water from slightly uphill of the site, which Arup said was "presumably the same spring that was shown on historical maps and likely to have been used at the brewery". The second source was the mine water issuing from an abandoned mineshaft driven to the surface "by the positive head within underlying mine working in the Hard Bed coal". Arup said that this water may have an adverse effect on the canal environment. They identified that one potential course was to try and find the mineshafts because, as they said, it was not known if the mineshafts had been located as part of the original development, or whether they were treated, or whether any investigations or treatment extended to the coal seem beneath the site.

146. Arup's next report was dated 21 February 2013. This was largely concerned with the presence of mine water on the site. At paragraph 6.1 of the report, Arup referred to the earlier assumption that the oxidization of the pyrites coming up from the mine working through the shaft gave a by-product of sulphuric acid, but noted that the observed neutral pH in the northern sample of water was not initially consistent with that assumption. The report however goes on:

> "A characteristic of mine water is low pH, however low pH does not necessarily persist on discharge at the surface as it is usually rapidly buffered. At Kirkstall buffering will occur when a discharge mixes with non-mine water and will be particularly rapid on contact with limestone fill or naturally occurring carbonate minerals, increasing pH to neutral. When the building was present it is likely that the block work minerals in contact with the water buffered the low pH mine water, whilst degrading the block work as observed on site."

147. A few days later, Mr Nevill informed Ms Holmes of the University that Arup thought they had found one of the mineshafts. He said:

> "There is a soft clear ochreous coloured mound just off the crest of the embankment in the NE corner of the site a couple of metres from the manhole. I do not recall seeing anything like that when we have previously been on site."

This mound was very close to the southern mineshaft shown on the original British Coal drawing. As noted on ***Figure 2***, that was close to the old watercourse and close to the area of the worst damage.

148. On 29 April 2013 Arup provided a final report dealing with groundwater treatment options. This continued to deal with the spring water and the ochreous water as separate problems. Relatively extensive drainage works were then proposed for the site, which I saw when I visited site. Two separate drainage systems, one dealing with the spring water and one dealing with the ochreous water, continue to disperse water away from the site of the now demolished F1/F2 Building. It does not appear that any of the groundwater flows into the canal; instead, the system pumps water uphill in a south-westerly direction to a pumping station in the southwest corner of what would have been the F1/F2 Building.

149. Arup continued to be involved in the exchanges with Natural England about the possible discharge of spring water into the canal. The email exchanges in July made clear that, provided the mine water was removed from the spring water discharge, Natural England would not object to the spring water issuing in to the canal, provided it could be shown that the spring naturally issued into the canal prior to the demolition of the F1/F2 Building. Arup were entirely happy on that last point, replying on 25 July 2013 "as we discussed the location of the current spring water discharge correlates very well with the location of the stream shown on the historical maps."

5.6 The Preliminary Reports of the Claimant's Experts

5.6.1 Mr Sargent's Report of October 2015

150. Mr Sargent was the claimant's expert hydrologist. He provided the claimant with an early report in October 2015. It is important for two reasons.

151. First, his report deals with the impact of mineshafts and mine water. It deals at some length with the historical mapping of mineshafts and, referring to the second mineshaft shown on the British Coal records, Mr Sargent was clear that there was an issue of water close to that location that was visible on site. He said the ground around the emergence was highly stained with ferruginous material "at or very close to the southern most of the two mineshaft locations". In addition, he said that, as a result of shallow coal mine workings, the site was in an area of "high risk". He concluded that the second source of water on site at the time of his inspection came from the mineshaft (see paragraphs 4.9, 4.30 and 5.2 of the report).

152. Somewhat surprisingly, during his oral evidence, Mr Sargent resiled from this and claimed that it was very doubtful that there were in fact any mineshafts in the vicinity. This appeared to be based on the simple fact that the construction records indicated that there had been a search for the mineshafts and they had not been located. In my judgment, that was not a proper or reasoned basis for Mr Sargent to contradict one of the two principal themes of his first report, namely that a mineshaft was the source of the ochreous water that he saw on site in 2015. This element of his evidence was therefore unsatisfactory, and I reject it as inconsistent, not only with his original report, but with all the other evidence on the topic (not least Arup's advice at paragraph 147 above that they had actually found one of the mineshafts). Despite Mr Taverner's urging to the contrary, however, I decline to find that, in consequence, Mr Sargent had failed to act properly as an expert witness.

153. Mr Sargent's other main point in his first report was that the larger water issue was of clear water, arising near the centre of the F1/F2 Building footprint. He expressly made the connection between that area and the issue or stream indicated on the historical maps (see paragraph 3.18). At paragraph 4.15 he indicated that there are several seepages of water from the aquifer outcrop on site, but asserts that the spring adjacent to the F1/F2 Building footprint "appears to be the main outflow". He noted that earlier maps "show the spring to be in a similar location to present, but higher up the slope, which was probably a continuous feature at the time and not terraced as it is now." He concluded at paragraph 5.3:

> "It would appear from old maps that this spring has been in existence for a long time and gave rise to a small watercourse

> which flowed over the site of the Turner and Bridge building before the development of the area, although it may not have been visible at all times, as indicated by the ground water model."

154. I consider that this was important evidence which confirmed Arup's view that that the damage and the water flow seen on site were broadly in the line of the old watercourse.

5.6.2 The First Report of Dr Sims of October 2015

155. Dr Sims was the University's expert on materials and chemicals. He also produced a report in October 2015. As to the sulphate attack, he said:

> "9. The installation of a vulnerable concrete material in a potentially aggressive ground environment is a type of 'latent defect', the possibly adverse effects of which will depend on many factors for both occurrence at all and then for the rates of their progression. In this case the damage found has clearly occurred within the short period from construction in 1995 to evacuation in 2011 so that, given an initial period of non-apparent incipient reactivity, it is reasonable to suppose, as suggested by Arup, the damage probably occurred over an overall period of about 10 years. However, if the presence and degree of flowing ground water was fluctuating, initiation might have been delayed and damage might have occurred or worsened sporadically."

156. Dr Sims linked the damage to the blockwork to both water leaching and various forms of sulphate attack. He said that it was an oversimplification to identify sulphate attack as the sole cause of the deterioration because the details were consistent with leaching from water solutions. That explained why, at paragraph 7 of section 3 of his first report, Dr Sims said that the chemical reactions could proceed at varying rates depending on a range of factors including the mobility of the ground water. He reiterated that what he himself described as "the deterioration" was a combination of "leaching by migrating water and *some* sulphate attack."

157. When he gave oral evidence, Dr Sims reiterated the view expressed in his first report that the period of 10 years cited by Arup for the overall deterioration was reasonable. Beyond that he was reluctant to put a figure on it.

5.6.3 Summary

158. In my judgment, the early reports from two of the three University's experts called at trial, were straightforward and clear-cut expressions of opinion. Both were supportive of a number of elements of the case now advanced by the defendant. I consider them to be important parts of the evidential background, particularly on the question of causation.

5.7 The Recent Investigations

159. I should say a word about the recent investigations, carried out in early February of this year. At the PTR on 20 January 2017, the defendant sought an order permitting the drainage experts to return to site to carry out some further investigations, because Mr Corrigan was convinced that the as-built information on the Curtins' drawing Rev E was either wrong or unworkable (because it required the water to flow uphill in an east-west direction). This application was hotly contested by the University, even though this was not a matter which Mr Franklin had addressed in his report. Eventually I concluded that, since the defendant had made out an arguable case that the as-built drawing was wrong, it was going to help everyone to ascertain the true position on site.

160. I have summarised the results of the investigations in **Section 4.4.6** above, since the investigation focused on the drainage arrangements on the east side of the F1/F2 Building. Mr Corrigan was shown to have been right to conclude that the drainage was unlikely to have been built as shown on the Curtins' drawing Rev E, although the departures were even more radical than he had originally envisaged. None of the manholes on the eastern side had been built or could be found, and the perforated pipe appeared to act as a soakaway. These investigations, therefore, confirmed what Arup had said in their email of 2 March 2012 (paragraph 134 above), and are a major reason why I have concluded that there was no engineered outfall on that part of the site.

161. Unhappily, at trial, there were still debates about what could actually be seen on site and therefore what had been originally designed/built. There was still more speculation than I expected, given the order I had made at the PTR. I was particularly surprised to note that, at paragraph 3.21 of the second joint statement, dealing with the February 2017 investigation, Mr Corrigan had suggested further excavation along the eastern perimeter in a northerly direction "with a view to locating the primary land drain", but that Mr Franklin had consulted the claimant's solicitors, who had advised that this proposal was not in accordance with the court's order. In this way, that further excavation did not take place.

162. That was regrettable. There was nothing in my order which prevented any kind of further excavation if it would help the experts, and therefore the court, to ascertain what was built. On the contrary, my order was expressly based on the assumption that the further investigation would deal with as many of these issues of fact as possible. This artificial constraint imposed by the University's solicitors – which had no rational justification – was not in accordance with my order, and has made my task more onerous than it needed to be. Notwithstanding those difficulties, I have set out my findings of fact in **Section 4.4.6** above.

6. CAUSATION

6.1 Summary

163. I now set out my findings as to the cause of the damage to the F1/F2 Building. That will obviously have a direct impact on the specific disputes that arise under the Policy. In this **Section 6.1**, I summarise my findings on causation and, in the subsequent **Section 6.2**, I set out the detailed explanation for how and why I have arrived at those views.

164. The F1/F2 Building was built across the line of an old watercourse. ***Figure 2*** shows that the site of the worst damage to the blockwork was where the line of that watercourse met the eastern wall of the F1/F2 Building.

165. The Landcare report identified 7 separate natural springs arising in the vicinity of the F1/F2 Building: see ***Figure 3***. The location of springs 2, 3, 4, 4a and 5 are all broadly consistent with the line of the watercourse as shown on the O/S maps. Landcare made drainage recommendations as a result of their discovery of these springs which were not considered and/or never implemented.

166. The old watercourse and/or the springs recorded by Landcare were the source of the repeated difficulties with "spring water" which were recorded throughout the progress of the construction works between 1994 and 1996. These problems were dealt with in an ad hoc way. There was no overall design for the groundwater drainage.

167. In addition, the surface water drainage on the east side of the building was not built as originally designed (***Figure 1***). The design that was adopted was a kind of soakaway which meant that the water passing down the blue drains through the blockwork of the eastern wall (itself an ad hoc design to deal with a water problem on site) went into ground which was often saturated.

168. As a result of these factors, spring water flowed, as it had always flowed on this site, from west to east along the line and in the area of the watercourse shown on the maps (***Figure 2***). That water flowed against the concrete blockwork supporting the 4 storey-high inner cavity wall of the east elevation of the F1/F2 Building.

169. The flowing water caused both leaching and sulphate attack, which eventually reduced the concrete blocks to mush. Eventually, the internal leaf failed, because the four stories above were no longer supported by the concrete blocks.

6.2 Detailed Reasons

6.2.1 The Old Watercourse

170. There can be no doubt that, not only was the F1/F2 Building built over the site of the old watercourse, but the place where the internal leaf of the eastern wall crossed that old watercourse was the location of the worst of the damage. That is shown in the Arup drawing at ***Figure 2***. There is nothing in any of the construction records to indicate that anyone involved between 1993 and 1996 was ever aware of that. However, that this was what had happened was a conclusion reached by three of the University's advisors: BJB (see paragraph 115 above); Arup (see paragraph 132 above); and Mr Sargent (see paragraphs 153-154 above).

171. Expressly or impliedly, the University sought to draw the sting from this in three ways. First they said that, because the watercourse was not always shown on every O/S map, the court cannot conclude that there was a watercourse at that location at the time of the development in 1993-1996. I reject that. Enough of the O/S maps over a period of 80 years show the watercourse in the same location for the court to conclude with confidence that, prior to 1993, there was a watercourse coming down the slope to the canal at the point indicated. The maps show it sometimes as a stream, with its

own inlet into the banks of the canal, and sometimes as "issues". Although the length of the watercourse varied, it was always in the same place.

172. The second point the University took was that there was no sign of the watercourse after excavation and when construction commenced, a fact confirmed by Mr Webb. Whilst I am sure Mr Webb is right about what he saw, the point is still a bad one. Of course, the remainder of the watercourse itself would have been removed by the major excavation works of cut and fill, and would no longer have been visible. But what mattered was whether there was any water below the surface that would return after the site had stabilised to run down the same path. As noted below, contrary to the University's original stance, the contemporaneous records made plain that, throughout the construction phase, that was exactly what happened.

173. Thirdly, the University must argue that it is a coincidence that the worst of the damage caused by the flowing water just happened to be in the place where the eastern wall passed over the line of the old watercourse. I reject the suggestion of a coincidence. On the contrary, I find that it was entirely predictable that, unless the old watercourse (and the springs that fed it) was dealt with in a proactive and sensible way, there was always going to be a significant problem with groundwater flowing against the inner leaf of the eastern wall where the old watercourse had once run. Arup did not think it was a coincidence; as demonstrated by their exchanges with Natural England in 2013 (paragraph 149 above), they said expressly it was the same stream.

6.2.2 The Seven Springs

174. I consider that the most important document in the case was the Landcare report and the plan that went with it (***Figure 3***). This made plain beyond any doubt that there was going to be a serious groundwater problem on this site, unless there was an overall plan to deal with drainage[6]. It identified seven separate issues, which it described as natural springs[7], just in the area around or beneath the footprint of the F1/F2 Building itself.

175. The Landcare report recommended that the depth of the water be ascertained and then, depending on the depth, two options were advocated. If the water was deep, there would have to be a culvert dealing with issues 2, 3, 4, 4a and 5. If the water was shallow, the water from issues 2 and 3 would have to be piped round the northwest corner, although that was obviously not an option for issue 4a and 5. Moreover, for issue 5, which was within the footprint of the F1/F2 Building, the only two options identified by Landcare both involved culverting.

176. The work recommended by Landcare to establish the depth of the water on site was not carried out. This was a fundamental failing, from which many of the subsequent problems stemmed: if you don't know how deep the sub-surface water is, you cannot design an effective solution to deal with it. Neither of the options which Landcare indicated in their report was ever carried out. Indeed, there is no evidence that the

[6] This had rightly been identified as a problem even before the Landcare report. Indeed, water and drainage had been identified as a major risk right at the outset: see paragraph 34 above.

[7] Mr Sargent referred to these as 'springs' in his first report, but in his second referred to them as 'issues'. To the extent that the wording was changed in an attempt to lessen the impression of the amount of water on site, I deprecate it.

Landcare report was even considered by MCL, the company who eventually took charge of the design of the drainage. Further, there is no evidence that the design of the drainage was considered along with the design of the structure, something Mr Franklin said would usually happen. Instead, as set out in **Section 4** above, the water problems on site were regarded as merely an aspect of the construction works, and were dealt with in an ad hoc and unconvincing way.

177. The University had three arguments that endeavoured to address this aspect of the case. I reject each for the reasons noted below.

178. First they said that the Landcare report was effectively superseded by events, because the site was excavated, and thus the best thing to do was to deal with the water as and when it arose. In my view, this submission fails at every level. Landcare's recommendations were made on the basis that there would be excavations on site, so they had already considered the prospective effect of that work, and were advising that these were the options (depending on water depth) to be carried out after excavation. If excavating the ground meant that everything could only be designed afterwards, then there would have been no point in Landcare making these recommendations at all. As Mr Corrigan explained in his cross-examination:

> "I would say the appropriate response is to have a solution in place and to be able to modify and adapt that solution to meet exactly what occurs on site. I don't think you can turn up on site and have no idea what you are going to do and say 'well, let's wait for a spring to emerge and then resolve it'. You have to have a scheme – a solution – a scheme design in place that's going to help you do that because, quite frankly, turning up and responding to X, Y and Z problems is only going to create huge problems."

I accept that evidence. Moreover, as Mr Franklin was obliged to admit in cross-examination, not tackling the drainage design until the end of the excavation works was 'leaving it a bit late'. It must follow, therefore, that doing nothing until the construction works were underway was plainly too late. Mr Sargent said that it should have been done at the time of excavation and relevelling.

179. In addition, as was noted in the oral evidence, the excavation would serve to suppress the water for a time, but it would not resolve it or banish it from site. If the places noted on ***Figure 2*** were the known locations of the water before the excavations, they were the best starting point to discover where the water was and how to deal with it after the excavations had been completed. The proof of that pudding was in the eating: that was where the water emerged during the construction of the foundations of the F1/F2 Building.

180. The second argument advanced by the University was that, although no work was done to establish the depth of the water on site, option 2 recommended by Landcare was carried out, at least in part, because of the land drains that were put in behind and beneath the crib-lock wall in the car park to the west of the F1/F2 Building. For a number of reasons, I reject that submission.

181. First, land drains, sometimes referred to in the documents as French drains, involve gravel and textile materials but do not always involve pipes. It is not wholly clear

what was done here. In contrast, Landcare's option 2 was unequivocal: they said that the water should be 'piped'. Secondly, what Landcare had in mind, as an alternative to the culvert, was a system which caught and contained the water at issues 2 and 3 and piped it away to the north. There is no evidence that MCL ever identified issues 2 and 3, let alone installed pipes in order to catch, contain and take away that water. As Mr Corrigan said in cross-examination, "one of the classic solutions to dealing with spring water is to intercept them and to intercept them at the depth that they are likely to emerge". He said, and I accept, that MCL did not design a system to intercept the spring water, and that what they did design could not have hoped to intercept that water because they did not know the relevant depth. Thirdly, the land drain that was designed and built was not in the same location as issues 2 and 3, and there was nothing to say that it could or would deal with all the water from those issues.

182. Fourthly, and perhaps most important of all, the land drain to the west would not in any event deal with issues 4, 4a, 5 and 7, all of which were further down the slope and under or very close to the foundations of the F1/F2 Building. The water from those issues would not be dealt with by the land drain further back up the slope. Indeed, the complete failure to follow the Landcare report can perhaps best be demonstrated by reference to issue 5. I find on the balance of probabilities that this was at least one of the sources of the water which was bubbling up underneath the footprint of the F1/F2 Building. Landcare indicated that there were two options to deal with this water, and both options involved culverting. At no stage is there any evidence that this was considered by MCL or Curtins, let alone put in hand.

183. In short, I accept paragraph 30 of Mr Taverner's closing note. The land drains that were installed may have reduced the amount of water in the ground around the F1/F2 Building to a degree, but those land drains were not designed to, and could not, deal with all the water from the seven springs/issues in and around the F1/F2 Building, which would therefore have been subjected to water flows throughout its life.

184. The third argument advanced by the University, through Mr Franklin, was that the Landcare options were only some of the options available, which then set up the submission that what was actually done, although not what Landcare had recommended, was still adequate. That again is a hopeless argument. The Landcare report made clear that these were the options possible and did not identify others. A proper design, if departing from these options, would have had to explain why. MCL never did that. And for the reasons already noted, it was not an option to wait and see, which is all that MCL did.

185. The next question is this: following the excavation of the site, did the old watercourse and/or the seven issues/springs in the area of the old watercourse manifest themselves on site, at the time when (on the University's case) it was appropriate to consider the design of the groundwater drainage?

6.2.3 The Water During Construction

186. The University commenced these proceedings on the basis that this was a dry site which, after completion of the F1/F2 Building was inundated by unexpected natural springs. The old maps and the Landcare report both give the lie to that suggestion. But even without them, the construction records that were available to the University also demonstrate that, not only was this never a dry site and was always subject to

water and land drainage problems, but that acute problems caused by the natural springs were repeatedly encountered during the works.

187. The site records summarised in **Section 4** above are a catalogue of complaints and difficulties created by what are referred to as "spring water". There are repeated references to "springs", "stream", "watercourse" and water "welling up". There are other references to water flowing from west to east through the foundations that were being constructed for the F1/F2 Building, and that that water was becoming trapped within those foundations.

188. I find that the water that was evidenced in such copious amounts was the spring water that fed the watercourse on the O/S map, and was itself the water that emanated from the issues/springs shown in the plan attached to the Landcare report (***Figure 3***). As BJB put it at the time of the subsequent investigations, "the site is known to have historical springs in this location" (paragraph 107 above), and there had always been water on and through this site (paragraph 115 above). During construction, that water had to be dealt with on site and was the subject of the various ad hoc solutions identified in detail in **Section 4** above. But I reject absolutely Mr Franklin's suggestion that that showed that the drainage problems were being dealt with in a proactive or strategic way. They were not: had they been, the water would have been anticipated from the outset, and there would have been a design solution to deal with it.

189. Mr Nevill inadvertently posed the question (paragraph 132 above): how was the stream water incorporated into the land drainage at the site? The simple answer is: it was not. And so DCA were more right than they knew when, in March 1995, they had said that "no allowance had been made for water arising from springs which are known to discharge on this site" (paragraph 69 above).

6.2.4 The Failure To Deal With The Water

190. The failure to anticipate and deal with the water in the volumes and in the locations where it was actually encountered can perhaps best be illustrated by the fact that nobody at MCL – or any of the other third parties who were involved in considering this drainage design – ever worked out what was going to happen to the water after it had been diverted away from the immediate problem area.

191. Take as an example the land drain running along the western side of the building, from south to north. That might have taken some of the water away from the area, but that would then have gone into the SSSI at the north of the F1/F2 Building, and possibly into the pond shown on the landscaping drawing. But then what? No further drain was shown on a drawing or has been found on site. So that water would then have flowed south and east in accordance with the gradient of the land, and could therefore have flown back under the F1/F2 Building or onto the bank along the eastern side, compounding the waterlogged nature of that ground.

192. Or take, as another example, the solution of piping the water through the blockwork of the wall. In my view, there were all manner of things wrong with that. The first is that there was nothing to suggest that the pipes were of sufficient adequacy to deal with the volume of water that should have been anticipated. Of course, the fact that standing water and extensive water staining up the walls was found in the undercroft

demonstrated that the pipes were not adequate. Secondly, the pipes were positioned in such a way that flowing water would inevitably run up against the blockwork, even if it was eventually carried away by the pipes. Thirdly, no thought was given to what would happen to the water once it had passed through the blockwork. It went into the ground on the eastern side. For the reasons set out in **Section 4.4.6** above, that area was already liable to be waterlogged because of the failure to deal properly with the surface water drainage. Accordingly, that ground would have reached a point where it was so saturated that the water would have backed up into the undercroft and/or water would not have been able to pass down the blue pipes and away from the undercroft.

193. On this point, I remind myself that both Mr Gooud and Mr Nevill thought the design was inadequate (paragraph 126 above). Further, although it was a topic that was conspicuous by its absence in his report, Mr Franklin said in cross-examination that the primary reason why the groundwater drainage had failed was because there was more water than the drainage could cope with. I agree with that. And because I find that the amount and flow of water on site was predictable and broadly similar both before and after the construction of the F1/F2 Building (see **Section 7** below for the detailed explanation of this finding), that strongly suggests that the design of the groundwater drainage was faulty/defective.

194. In short, the drainage design did not consider the possible problems inherent in having the blockwork exposed to the continual running water that could and should have been anticipated on this site. I can only assume that that was why Landcare suggested culverting the water in the first place. The failure to follow the Landcare recommendations was symptomatic of the failure on the part of MCL to heed the significance of keeping the extensive amounts of water on site away from the structure that they were designing/building. When water became trapped in the foundations (which was inevitable given the location of the watercourse/springs) their only concern was to get the water through the F1/F2 Building and into the bank on its eastern side. It never occurred to them that this meant that water would be constantly in contact with the foundations of the building, and the concrete blocks on which the wall rested. That was something which, as Mr Franklin accepted in cross-examination, they needed to avoid as a matter of design. He said, "you don't want it [the water] coming into contact with it [the substructure]…if you can't keep it [the water] away, which we couldn't…you have to move it away…". He also agreed, in the same passage of cross-examination, that the design failed to achieve this. That was Mr Corrigan's view throughout.

195. Accordingly, I find that the water that used to run in the old watercourse, and which emanated from the springs identified by Landcare, continued to run in roughly the same place and in the same general quantities before and after the development in 1993-1996. Predictably, that water became entrapped in the foundations of the F1/F2 Building. And although this problem was noted on site during construction, the solution – the 3 or possibly 4 pipes through the long length of the F1/F2 Building – was inadequate. It was inadequate because it simply moved some of the water on to somewhere else, namely the east side of the F1/F2 Building. It failed to deal with the volume of water on site (which is why the photographs show evidence of staining and standing water) and it failed to protect the blockwork from the leaching and sulphate attack. The concrete blocks were turned to mush by the constant flowing groundwater

which, far from being some new or unpredictable event, would have been foretold by anyone who looked at the O/S maps, or read the Landcare report, or properly analysed the construction records.

6.2.5 Mine water

196. Some damage to the blockwork, albeit not in the principal area of damage, was caused by the ochreous element of the water. I consider that the most likely source of that element was the old mineshafts which had been identified by British Coal but which had not been located during the construction works. That gave rise to contamination of the water – which can still be seen on site – and damage to the blockwork. In reaching that view I rely on the views of the University's advisors, Arup (paragraphs 142-148 above) and Mr Sargent (paragraphs 151-152 above).

197. However, I am satisfied that, whilst this was a secondary cause of damage, and whilst the failure to locate and deal with the mineshafts at the time of construction was a further failure on the part of those responsible for the planning and design of these works, I am not persuaded that the contamination from the mine water was a serious or significant problem. In other words, even if the mineshafts had been dealt with, I consider that the leaching and sulphate attack would still have occurred and would still have meant that this cracking would have happened.

6.2.6 Summary

198. The exposure of the blockwork to the leaching and sulphate attack that arose from the constantly flowing water reduced the blockwork of the inner leaf of this large wall to a mush. That was an extremely unusual event: indeed, a number of the engineers who were involved had not seen that phenomenon before. However, it is easy to see why this case was so unhappily unique: those same engineers had doubtless not seen a building built across an old watercourse, with springs known to arise in and around the footprint of the building, with no plan or design to deal with either.

7. ISSUE 1: WAS THERE ACCIDENTAL DAMAGE?

7.1 The Law

199. Insurance lawyers often refer to accidental damage, the term relevant here,[8] as 'a fortuity', something that happened by chance. Beyond that, some of the attempts at definition are liable to mislead. For example, it has been suggested that, to be accidental, damage cannot be caused by an inherent vice of the subject matter, or by ordinary wear and tear. But that is not correct: in some situations, damage can occur due to an inherent vice and yet still be a fortuitous occurrence. In my view, 'accidental' simply means an event that occurs by chance, which is non-deliberate (wilful or deliberate damage is always excluded: see ***Patrick v Royal London Mutual Insurance Society Ltd*** [2006] EWCA Civ 421). I take comfort from the fact that this starting point is also the one taken by Paul Reed QC, the author of ***Construction All Risks Insurance***, Thompson Reuters, Second Edition (October 2016), at paragraph 10-002.

[8] See paragraph 9(a) above

200. I identify the relevant authorities on the topic of accidental damage in paragraphs 201-207 below, before summarising the essential principles in paragraph 208.

201. In ***The Xantho*** [1887] 12 App. Cas. 503 at 509, Lord Herschell said:

> "There must be some casualty, something which could not be foreseen as one of the necessary incidents of the adventure. The purpose of the policy is to secure an indemnity against accidents which may happen, not against events which must happen."

202. This passage highlights the difference between the risk of something happening, which will usually be covered by the policy, and the inevitability of something happening, which will not. The same point was made by Lord Sumner in ***British and Foreign Marine Insurance Company Ltd v Gaunt*** [1921] 2 AC 41, at 57:

> "There are, of course, limits to 'all risks.' They are risks and risks insured against. Accordingly the expression does not cover inherent vice or mere wear and tear or British capture. It covers a risk, not a certainty; it is something, which happens to the subject-matter from without, not the natural behaviour of that subject-matter, being what it is, in the circumstances under which it is carried. Nor is it a loss which the assured brings about by his own act, for then he has not merely exposed the goods to the chance of injury, he has injured them himself."

203. In the same case, Lord Birkenhead LC said that, for damage to be covered by an all risks policy, it "must be due to some fortuitous circumstance or casualty." He went on to identify what a claimant was required to do to demonstrate the necessary fortuity:

> "…the plaintiff discharges his special onus when he has proved that the loss was caused by some event covered by the general expression, and he is not bound to go further and prove the exact nature of the accident or casualty which, in fact, occasioned his loss."

204. The exclusion of inevitable events does not mean that the event causing the loss or damage has to be extraordinarily unusual or calamitous to qualify as accidental: it is enough that the event is non-inevitable (***Gaunt*** at pages 47, 52 and 58). Foreseeability is irrelevant (***The Miss Jay Jay*** [1985] 1 Lloyd's LR 264, affirmed at [1987] 1 Lloyd's LR 32). The test is that, if the parties to the contract would readily view the event as something that was going to happen, it should not be regarded as fortuitous: see ***C A Blackwell (Contractors) Ltd v Gerling Allegemeine Verischerungs-AG*** [2007] EWHC 84 (Comm). In that case, there was also an issue as to whether the defence of inevitability advanced by the insurers required the peril inevitably to occur at the particular time that it did in fact occur, or whether it was enough that the event would be inevitable at some point during the duration of the policy. For various reasons that question was not answered by the judge. It is however clear that the certainty or risk of loss has to be assessed prospectively, from

the time the policy was taken out: see ***Soya GmbH Mainz KG v White*** [1982] 1 Lloyd's Rep 136 at 150.

205. All risks policies will implicitly exclude damage due to ordinary wear and tear: as Paul Reed QC notes at paragraph 10-012, ordinary wear and tear is usually treated as an aspect of inevitability. He also notes that such policies are "not an indemnity against the ordinary action of the elements". In cases where the damage results from an interaction between an inherent defect and ordinary usage, he suggests that there is a critical distinction between those cases where the casualty was caused by an inherent weakness, as opposed to those cases where there has been some external fortuitous event: see ***The D C Merwestone*** [2012] EWHC 1666 (Comm), at paragraph 57.

206. Some of these points were considered in ***Global Process Systems Inc and Another v Syarikat Takaful Malaysia Bhd ("The Cendor Mopu")*** [2011] UKSC 5. In that case an oilrig was being transported across the sea on a barge and suffered catastrophic damage when waves of a particular height and direction caused metal fatigue. The Supreme Court found that the proximate cause was an insured peril of the sea, not ordinary wear and tear. On the facts, this was perhaps unsurprising, given that the evidence was that the leg of the rig was an enormously strong structure and that, in order to do the damage that was done, "you've got to catch it just right if you want to make it actually fail all the way round". As to principle, Lord Mance said:

> "…in other words, on the face of it, anything that would otherwise count as a fortuitous external accident or casualty will suffice to prevent the loss being attributed to inherent vice.
> …
>
> 81. On this basis, it would only be if the loss or damage could be said to be due either to uneventful wear and tear (or 'debility') in the prevailing weather conditions or to inherent characteristics of the hull or cargo not involving any fortuitous external accident or casualty that insurers would have a defence…While not myself attempting any exact definition, ordinary wear and tear and ordinary leakage and breakage would thus cover loss or damage resulting from the normal vicissitudes of use in the case of a vessel, or of handling and carriage in the case of cargo, while inherent vice would cover inherent characteristics of or defects in a hull or cargo leading to it causing loss or damage to itself – in each case without any fortuitous external accident or casualty."

207. Finally, I should refer to ***Tektrol Ltd v International Insurance Co of Hanover Ltd*** [2006] 1 Lloyd's LR 38, on which Mr Hickey placed some reliance, in particular on the passage at paragraph 20 of the judgment of Carnwath LJ (as he then was). The judge referred to the 'all-risks' policy in that case, and said that he was prepared to accept that the exclusion clauses were intended 'to shape' the cover in respect of particular risks. I derived no help from this authority. The proper construction of an insurance policy must depend on the words used in that policy, not what another judge said about a different policy in another case. Moreover, it is clear that his acceptance was at best reluctant, because he went on to say that "it does not seem the

most obvious drafting technique to achieve [that intention]". Carnwath LJ said expressly that he had not found the policy in ***Tektrol*** easy to construe; in my view, applying the ordinary rules of construction (as most recently summarised by Lord Neuberger in ***Arnold v Britten*** [2015] UKSC 36), the policy wording in the present case is much more straightforward.

208. In my view, the following principles can be summarised from these cases:

(a) The claimant must prove that the loss was caused by some event covered by the general policy wording, but does not have to prove the exact nature of the accident or casualty (***Gaunt***).

(b) Accidental damage means damage that was not wilful or deliberate (***Xantho***, ***Patrick***);

(c) Accidental damage means damage that was caused by a chance event, against the risk of which the insurance was taken out (***Xantho***, ***Gaunt***);

(d) Accidental damage does not mean damage that was inevitable (***Blackwell***);

(e) Inevitability will be assessed prospectively, from the time that the cover was taken out (***Soya***). Foreseeability is irrelevant (***The Miss Jay Jay***);

(f) Accidental damage does not mean damage to the property due to the inherent characteristics of that property (***The Cendor Mopu***);

(g) There is a critical distinction between those cases where the damage was caused by an inherent weakness and those where it was caused by an external fortuitous event (***The DC Merwestone***);

(h) The policy should be construed in accordance with the ordinary rules of construction, most recently summarised in ***Arnold v Britten***.

With these principles in mind, I turn to the first dispute, as to whether or not this is a case of accidental damage.

7.2 Was There a Flood or Any Other Discernible Accident?

209. Mr Hickey is right to say that a claimant claiming under an all risks policy does not need to demonstrate precisely what the accident was. This is not the sort of insurance policy where it is necessary for the claimant, at least for these purposes, to identify a defined peril or a particular cause, in order to bring itself within the policy. But as set out in paragraph 208(a) above, the claimant must show that the loss was caused by an event covered by the policy wording, in this case "accidental damage". In any event, I find it a helpful way of analysing whether or not this is a case of accidental damage by starting with a consideration of the case that the claimant has pleaded (see paragraph 14 above), to the effect that the damage in December 2011 was caused by a flood.

210. Mr Sargent, the university's expert hydrologist, defined flood as "a covering by water of land not normally covered by water".[9] His expert's report did not go on to analyse this aspect of the case any further, and certainly did not conclude that what happened in December 2011 was a flood within that definition. Even more importantly, the joint statement of the hydrologists dealt with the possibility of flood. Mr Ferry, the defendant's expert hydrologist, set out there his view that this was not a flood. Mr Sargent did not disagree and in his cross-examination, he admitted that, as a hydrologist, he would not have described anything that happened here as a flood. Dr Sims also said that this was not a flood.

211. Accordingly, there is no evidence before the court of any kind to support the claimant's pleaded case that the fortuity in this case was a flood: all the evidence was the other way. Taking Mr Sargent's definition (which is also the definition used by Mr Ferry in setting out his brief conclusions that what occurred could not be described as a flood), the area in the centre of the east wall below the undercroft was land that was not normally free of water. On the contrary, the O/S maps, the Landcare report and the construction records make clear that it was very often covered with water, at least to some extent, and that, even after cutting and filling, the land around and below the F1/F2 Building was regularly and repeatedly covered with water.

212. During the trial, the claimant indicated a slightly different case on the accidental nature of the damage, which did not rely on a flood as such. Thus, during his cross-examination of the defendant's witnesses, Mr Hickey suggested on more than one occasion that, even if there had not been a flood, there was much more water on site in 2011 than there had been before. On one occasion, he suggested that there may have been a new spring which came to the surface at some point during the lifetime of the F1/F2 Building, and which caused the water problems. In addition, I have already noted paragraph 18 of the APoC, which sought to set up a case that the water that did the damage was due to excessive rainfall from 2007 onwards.

213. The difficulty with all these alternative arguments was that there was no evidence to support any of them, and a good deal of evidence to contradict them. There were no measurements taken of what the flow or volume of water was on this site before excavation, or after excavation but before construction, or after construction. There was no detailed means of comparing the amount and the flow of water on different dates. On the other hand, the anecdotal references during construction to the "stream" or the "watercourse", or the water overtopping the concrete beam, or the water "welling up" inside the foundations, all suggest that water flow and volume were never significantly different, before or after the works. The standing water, staining and tide marks in the undercroft also suggest that there was no material difference between any 'before' and 'after' date. BJB said in 2012 (paragraph 115 above) that there had been no change in the water, which 'had always been there'. Dr Roberts (the defendant's expert structural engineering expert) said that the water flow "was a

[9] On this point, my attention was drawn to the decision of Jackson J (as he then was) in ***The Board of Trustees of the Tate Gallery v Duffy Construction Limited*** [2007] EWHC 361 (TCC). At paragraph 37(i)he noted that the cases do not lay down rules of law as to the meaning of the words 'flood'. Amongst the matters which he said needed to be considered in reaching a conclusion as to whether there had been a flood were: whether the source of the water was natural; whether the source of the water was external or internal; the quantity of water; the manner of its arrival; the area of and character of the property upon which the water was deposited; and whether the arrival of that water was an abnormal event. In the present case, the source of the water was natural, and external. There was a good deal of water flowing where it had always flowed, on a site which was therefore regularly inundated. On that basis too, it was not a flood.

natural continuation of the situation that clearly existed previously on site". Thus, in the absence of any relevant evidence post-completion (of, say, particularly bad weather, or the discovery of a significant new spring coming out of the ground where one had never been before), I cannot find any material difference in water volume or flow rate to explain what happened in 2011.

214. The continuous presence of water on site was best summarised by Dr Roberts during his cross-examination, when he said:

> "Sorry, my point about that is, you know, every two months a new spring crops up, all through that process. It delays the work but there's piling done, the ground beams are done, still water coming up at different times in that process. Then the block work is built and then – then the ground floor bison precast units are put on and you never see what happens again under the building…and my view is, therefore, who says the next spring didn't come up two months later? I mean that's my engineering logic."

215. For these reasons, I reject the claimant's pleaded case that the fortuity that occurred in December 2011 was or could be described as a flood. I also reject the alternative suggestion that there was any material increase in the water volume or flow between 1993 (just before any work began) and 2011 (when the damage occurred). On that basis, it is difficult to see what the fortuity might have been. So the next logical question is to ask whether what happened in December 2011 was inevitable.

7.3 Was What Happened Inevitable?

216. For the reasons set out below, I find that, when the insurance contract was taken out in August 2011, the damage that was to occur in December 2011 was inevitable. At the time that the contract of insurance was taken out, there was not simply a risk that the concrete blockwork would fail; it was inevitable that the concrete blockwork would fail. If the parties had known the full facts, I find that they would have readily agreed that that would be what would happen.

217. First, for the reasons already explained, the concrete blockwork sat across the path or paths that water had taken and was continuing to take as it flowed down this slope. Either it was built across the old watercourse which, following the cutting and filling on site, re-established itself in precisely the same place as it had been for the previous 80 years or, at the very least, it was built across the inevitable collecting point for some or all of the seven separate issues/springs noted in the Landcare report, something which had not been addressed in any part of the design.

218. Either way, I am in no doubt that flowing water ran up against this blockwork ever since it had been completed in 1996. In consequence, the leaching and the sulphate attack caused by the constantly flowing water progressively weakened the structural strength of the concrete blocks until December 2011, when they failed. In my view, that failure was inevitable from the outset: the only thing that was unknown was precisely when the failure would occur. Arup thought that the deterioration had been going on for at least 10 years before December 2011, and Dr Sims said that that was a reasonable assessment. In my view, that is the minimum period over which the

deterioration happened: after the initial period when the blocks would have had the strength to stand up against the water flow, it seems plain that the deterioration was inexorable.

219. Two points arise as to timing. First, dealing with the unanswered issue in ***Blackwell***, noted in paragraph 204 above, I conclude that it is enough that the relevant damage was inevitable at some point during the duration of the policy. It would be absurd if the defendant had to prove that, in this case, the damage was inevitably going to occur on a particular night in December 2011. Secondly, it is important to note that the policy was taken out in August 2011, and that the relevant period of cover started on 1 August, only 4½ months before the collapse. All of the evidence indicates beyond doubt that, at that point, regardless of how quick or how slow the deterioration had been up to then, the collapse was inevitable. That is sufficient for me to conclude that this was not a fortuity that occurred during the period of the policy, but an inevitable consequence of the F1/F2 Building as designed and the environment in which it found itself, namely its exposure to the groundwater that was always there.

220. Standing back, it is important to note that, at different times, those who investigated the problem and the experts who gave evidence before the court, referred to this as "a latent defect" (see Dr Sims' first report at paragraph 155 above, confirmed in his oral evidence, and the description used by Dr Roberts, which was not challenged); and/or "deterioration" (see the Arup reports such as the one cited at paragraph 131(e) above, and Dr Sims' first report at paragraph 156 above). The use of such words and phrases, in my view, is inconsistent with a fortuity or risk of accidental damage, and consistent with something inherent and inevitable; something that was always going to happen.

7.4 Summary

221. For the reasons set out above, I have concluded that what happened in December 2011 was not accidental damage within the meaning of this policy. There was no flood and no increase or change in the volume or flow of water on site. Furthermore, when the policy was taken out in August 2011, the collapse was inevitable. The blocks were at different stages of degradation but, by then, those around the centre of the eastern wall were close to failure and there was nothing that could have been done to save them.

222. On this basis, the University's claim fails. However, it is important that I go on and deal with the exclusion clauses. Accordingly, **Sections 8**, **9**, **10** and **11** of this Judgment assume that the conclusions set out above are wrong and that, contrary to my primary finding, this was accidental damage. It is then for the defendant to show that one or more of the exclusions applies.

8. ISSUE 2: WAS THE DAMAGE CAUSED BY GRADUAL DETERIORATION?

8.1 Accidental Damage and Gradual Deterioration

223. It was Mr Hickey's primary submission that, if the damage which occurred was accidental damage within the coverage of the policy, then it inevitably followed that it could not have been caused by gradual deterioration. He said that he derived support for that submission from the line of cases to which I have referred in **Section 7.1**

above, and maintained that, if the damage was accidental, an exclusion for wear and tear (whether express or implied) could not apply.

224. In my view, the principal difficulty with that submission is that it is contrary to the wording of this policy. I have set out the general provision as to cover at paragraph 6 above. That makes plain that the defendant was liable if the property insured was the subject of accidental damage, "other than by an excluded cause". So, as a matter of the ordinary words used in this policy, even if the cause of the damage was a fortuity or an accident, the defendant would not be liable to the claimant **if** that fortuity or accident was an "excluded cause" under the terms of the policy.

225. Putting the point another way, there is nothing in the policy which said that, if the damage was accidental, the stated exclusions somehow did not apply. Indeed, such an interpretation would be contrary to the wording of the coverage clause, and contrary to commercial common sense. The exclusions would be rendered irrelevant if Mr Hickey was right, because on his approach, the proof of accidental damage would somehow 'trump' the stated exclusions. That is the complete opposite of the way in which the policy is worded.

226. On that basis, pursuant to ordinary principles of construction, the exclusions in the policy fall to be considered in this way: assuming that the damage was accidental, was the cause of that damage an excluded cause?

8.2 Gradual Deterioration: The Law

227. Mr Hickey argued that the words "gradual deterioration" in exclusion 1(a) (paragraph 8 above) meant the deterioration of the thing itself, without any influence from an external source. Mr Taverner said that no basis for such a distinction could be found within the exclusion clause itself, and argued that deterioration inevitably involved an interaction between the property being insured and its environment.

228. I accept Mr Taverner's submissions. In my judgment, they better reflect Lord Sumner's words in ***Gaunt***, that what matters is the natural behaviour of the subject matter "being what it is, in the circumstances under which it is carried" (or in this case, designed/built): see paragraph 202 above.

229. In my view, it would be artificial to construe this exclusion as referring only to deterioration caused by the thing itself, rather than the interaction of the thing itself – in this case, the building – and the circumstances in which it existed, namely the ground on which it stood and the water which flowed against it. That would be an unnecessarily complicated and restricted reading of the provision, which finds no basis in the words of the exclusion. In support of that conclusion, I also note that the exclusion itself refers not only to gradual deterioration, but to "frost" and "change in water table level". Both of those causes of damage are classic examples of the property being damaged by its circumstances: frost and changes in the water table are not inherent in the property itself; they are instead part of the circumstances in which the property exists. Thus, as a matter of construction and of common sense, I conclude that gradual deterioration can be caused by the interaction between the property insured and the circumstances in which that property exists.

230. For the avoidance of doubt, I do not consider that ***The Cendor Mopu*** has any relevance to this particular debate. That was a case about causation, and whether the loss was caused by an inherent vice or a peril of the sea. The evidence suggested the latter. As the Supreme Court noted, if the damage in that case was not due to a peril of the sea, it was difficult to see what the policy covered.

231. As to the meaning of the words "gradual deterioration", there was no dispute as to what was meant by deterioration: it is "the process of becoming progressively worse". Moreover, as noted in paragraphs 217-220 above, it seems to me plain that the proposition that these concrete blocks deteriorated is beyond question. That leaves the meaning of the word "gradual".

232. Mr Hickey argued that "gradual" could denote a very speedy process. Thus he argued that, in the case of a fire in a factory, the fire might have started at a particular machine but, to the extent that it spread to the building housing the machine or other parts of the factory complex, that was a gradual process and could be caught by this phrase, an argument he deployed in support of his primary submission that accidental damage trumped everything else.

233. I reject that submission. It seems to me that the word 'gradual' is intended to convey something which developed over time. If deterioration is itself progressive (ie it takes place over time), then gradual deterioration must mean a process that may go even more slowly. Thus, in ***Burts and Harvey Ltd v Vulcan Boiler and General Insurance Company Ltd*** [1966] Lloyd's LR 1 page 161, Lawton J rejected the insurers' reliance on an exclusion for 'gradually developing flaws or defects' in circumstances where, in a chemical plant, the crack in the tube of a heat exchanger allowed water to mix with a gas to form a very corrosive acid which then caused damage. Lawton J said that the split in the tube was not a gradually developing flaw but a sudden breakdown of the tube. He said "it was sudden and dramatic, and was not, in fact, a gradual development of anything at all in the sense which gives any reality to the wording of condition 3(b) of the policy".

234. Similarly, in ***AMEC Civil Engineering Ltd v Norwich Union Fire Insurance Society Ltd*** [2003] EWHC 1341 (TCC) HHJ Seymour QC said (albeit obiter) that if, contrary to his primary conclusion, AMEC had suffered loss as a result of the rusting of reinforcement within the concrete blocks, the exclusion for "gradual deterioration" would have applied. He said that the phrase meant "a deterioration which is progressive by degrees, as opposed to sudden and catastrophic".

235. In further support of his case as to the meaning of 'gradual deterioration', Mr Taverner took me to some Californian cases, including ***Butki v United Services Automobile Association*** (1990) California Court of Appeal Decisions 3d 225; ***Brodkin v State Farms Fire and Casualty Company*** (1989) 217 Cal App. 3d 710 and ***Murray v State Farm Fire and Casualty Company*** (1990) 268 Cal Rptr.33 (Cal. App. 4 dist 1990).

236. I accept Mr Hickey's submission that these cases should be treated with caution because of the different approach to causation in the USA. However, I consider that they are of some assistance on the meaning of 'gradual deterioration'. In ***Murray*** the court said it could envisage situations in which a homeowner suffered damage which was not instantaneous but nonetheless occurred over a sufficiently short period of

time such that it could not be characterised as deterioration. The court also said that deterioration was not qualified by the words 'normal' or 'usual'. A similar result occurred in ***Butki***, where the cracking of the foundation (due to high level of sulphates in the soil) first became evident 10 years after the house was constructed. This was classified as deterioration, the court saying that the exclusion meant that the insurer "will not cover slow-moving deterioration…if it did, the policy would be no more than a maintenance agreement". ***Brodkin*** was to the same effect, the court expressly noting that the insurer was not liable for "slow-moving disintegration or corrosion of the concrete because of external forces".

8.3 Analysis

237. I have already noted that those who investigated this problem repeatedly referred to the deterioration of the blockwork having taken place over a lengthy period of time. BJB said that the water had been present "for many years" (paragraph 115 above). Arup suggested that the deterioration had been occurring for a period of at least 10 years (paragraph 138 above). Dr Sims did not disagree with that. Dr Roberts said that the deterioration would have occurred over the lifetime of the building. It is difficult to see how else that which occurred could be described, other than as "gradual deterioration". On the basis of the authorities noted in paragraphs 233-236 above, this was gradual deterioration; it was not sudden, dramatic, or catastrophic.

238. In anticipation of this major difficulty for his case, Mr Hickey submitted that, in truth, the relevant damage here was not the damage to the blockwork, but the cracking which occurred at the junctions of the floors and walls on the inside of the building on 13 December 2011. He said that this damage was sudden, occurring as it did overnight. Thus he said that the damage, namely the cracking, was not the result of gradual deterioration, but was instead a sudden event.

239. In my view, this ingenious (albeit unpleaded) argument ignores the mechanism of failure. The cracking that occurred on 13 December was simply the visible sign of the hidden but gradual deterioration of the blockwork. The blockwork gradually deteriorated until it could no longer safely hold up the inner leaf of the eastern wall. The damage to the blockwork manifested itself in the dropping of that inner leaf, which inevitably caused cracking and further damage. But it was all damage caused by the water flow in the undercroft. But for the damage to the blockwork, there would have been no damage to the walls and ceilings; all of that damage was caused by the gradual deterioration of the hidden blockwork.

240. In support of his argument, Mr Hickey relied on ***The Nukila*** [1997] 2 Lloyd's LR 146, a decision of the Court of Appeal which centred on whether one physical part of a floating platform could be separated, for insurance purposes, from another. I again derived limited assistance from that case. Not only was it about a very different policy, but that policy expressly covered damage caused by a latent defect, which explains why the insured won in the Court of Appeal. That is not the case here. Furthermore, I am not persuaded that, in the present case, I need to embark on an analysis of the incremental differences between a defect, on the one hand, and damage, on the other[10]. Here, on the facts, there was physical damage to the

[10] Chapter 14 of Paul Reed QC's book contains a comprehensive review of this topic. Although, in my view, the point does not arise here on the facts, I do not consider that any part of my Judgment is contrary to his analysis.

blockwork (the process by which it became mush), which led to further physical damage to the superstructure. Thus the potential difference does not arise for consideration.[11]

241. In any event, if Mr Hickey was right about this, it would mean that all the University was concerned about were the cracks to the internal walls and ceilings, and their claim would be for the costs of re-plastering and re-painting those elements of the F1/F2 Building. But that ignores the reality of what happened in 2011-2012. Here the University was properly concerned about the long-term safety of the F1/F2 Building. Arup advised in February 2012 (paragraph 141 above) that they could not prove that the building was safe even for a further year, and they constantly advised that it had to be demolished. The F1/F2 Building did not have to be demolished because of the plaster cracks to the internal walls and ceiling junctions. It had to be demolished because the structural blockwork had gradually deteriorated to such a point that it was insufficient to support a 4 storey wall. On that analysis too, the relevant damage was to the blockwork, not the visible signs of that damage in the F1/F2 Building above.

8.4 Summary

242. Accordingly, for the reasons set out above, I conclude that, as a matter of construction, even if (contrary to my primary view) this was accidental damage, it was excluded because the cause of the damage was gradual deterioration. The relevant exclusion encompassed the effect of its environment (in this case the ground and the flowing water) on the insured property. The relevant damage was caused by an inherent weakness or an inherent characteristic of the F1/F2 Building. That damage, which was to the blockwork, happened over a period of at least 10 years (thereby pre-dating the relevant period of insurance by many years).

9. ISSUE 3: WAS THE DAMAGE CAUSED BY FAULTY/DEFECTIVE DESIGN?

9.1 Accidental Damage and Faulty/Defective Design

243. The point of law taken by the University, noted in **Section 8.1** above, which I have resolved in the defendant's favour, arises here too. But it is important to stress my conclusion that, even if I was wrong about the interplay between accidental damage on the one hand, and gradual deterioration on the other, I am entirely satisfied that, on any view of the authorities, the damage could be accidental damage but the defendant's liability for it would still be excluded if the provision relating to faulty/defective design was found to apply on the facts.

244. That is not only for the same reason of contract construction to which I have referred at paragraph 224 above. It is also because the authorities relied on by Mr Hickey noted in **Sections 7.1** above all refer to the contrast between accidental damage, on the one hand, and wear and tear/inherent vice/gradual deterioration, on the other. None of those cases was concerned with an exclusion for faulty/defective design.

245. On the other hand, the decision in ***British Columbia Rail Ltd v American Home Assurance*** (1991) CanLII 5713 (BC CA) was directly on point. In that case, there was

[11] I should add for completeness that, on this topic Mr Taverner referred to ***Skanka Construction Ltd v Egger (Barony) Ltd*** [2001] EWCA Civ. 310, I agree with Mr Hickey that that case too was of no assistance on the disputes before me.

an 'all risks' policy, but it excluded damage caused by 'error in design'. The failure of the embankment happened as a result of a flawed design, which wrongly assumed that the substratum of the fill was on colluvium, and not on lacustrine soils. That was an error of design under the terms of the policy, so the claim failed. There was no suggestion that the accident – the sliding of the embankment - somehow trumped the exclusion for error in design, in the way contended for by Mr Hickey in the present case.

246. Thus I am satisfied that, as a matter of principle, accidental damage can be the subject of an operable exclusion for faulty design. Here that arises out of the proper construction of the coverage clause (see paragraph 224 above), the authority of ***British Columbia Rail***, and out of common sense. Damage can be accidental, but it can still be due to faulty design. If so, it would be excluded under the terms of this policy, and refusal of liability would not be contrary to the principles in the ***Cendor Mopu*** and the other cases noted in **Section 7.1** above.

9.2 What is Required To Establish Faulty/Defective Design?

247. It is well-established that, in order to bring themselves within this sort of exclusion, an insurer is not required to demonstrate negligence or personal blame: see ***Hitchins (Hatfield) Ltd v Prudential Assurance Co Ltd*** [1991] 2 Lloyd's LR 580. That decision itself relied on an Australian case, ***Queensland Government Railways and Electric Power Transmission Pty Ltd v Manufacturers Mutual Insurance Ltd*** [1969] 1 Lloyd's Rep 214, where the design of the piers was not robust enough to deal with flooding. Mr Taverner said that these cases showed that all the defendant had to demonstrate was that the design was not fit for its purpose. I did not understand Mr Hickey to dissent from that proposition. That is therefore the test which I shall apply to the design in this case.

9.3 Analysis

248. For the detailed reasons set out in **Sections 4 and 6** above, I conclude that the design of the groundwater drainage (and/or the designed interaction between that drainage and the structure of the F1/F2 Building) was faulty and defective. It was unfit for its purpose. Moreover, even if I was wrong about both accidental damage and gradual deterioration, I am entirely satisfied that this part of the exclusion, taken on its own, means that the defendant is not liable to the University under the terms of the policy. Although Mr Taverner has dealt with the disputes in the order in which they arose under the policy, I am in no doubt that this is the defendant's single best point. Indeed, on my analysis of what happened, the proposition that the design was not fit for its purpose is unanswerable.

249. I make this point at the outset because, in his closing submissions, Mr Hickey told me that there were many universities up and down the country watching this case with interest and concern, who might be affected by the result. Of course, that is not a matter which ultimately can have any bearing on my decision. But, given that information, it is important that I stress for their benefit that, in my view, it is unlikely that other universities have buildings that were designed in this particularly slipshod and ultimately calamitous way.

250. The over-arching problem with the design of the groundwater drainage system here was that, in many ways, there was simply no design at all. Despite the fact that drainage was identified as a risk from the outset (paragraph 34 above); despite the warnings in the SSL report (paragraphs 35-40 above); and despite the detailed advice in the Landcare report (paragraphs 46-47 above), no heed was paid to the need for a careful system of land drainage. As set out in **Sections 4 and 6** above, I find that there was no strategic or proactive drainage design of any kind. The only elements of the groundwater drainage that were designed and installed arose as a result of the acute water problems encountered during the construction work itself. I agree with Mr Corrigan and Dr Roberts that the groundwater drainage design was inadequate.

251. I also consider that, by the end of the trial, there was no longer a real dispute about this. Mr Franklin made a number of important admissions about the inadequacy of the groundwater drainage design: see by way of example his evidence noted at paragraphs 61, 72, 79, and 87 above. Most significantly of all, in cross-examination on Day 6, page 94, he effectively agreed that the design was not fit for purpose. He expressly said that "the drainage systems didn't ultimately – couldn't ultimately cope with what occurred". When it was put to him that this meant that the design was not ultimately fit for its purpose, Mr Franklin hedged and said he "didn't necessarily agree with that". However, his only qualification arose out of what he described as the "extraordinary circumstances" here, which appeared to be a reference to the argument that there was more water than had been anticipated. However, as I have already noted, no one has ever done any comparison to make good that assertion, so there was no evidence to support it. In fact, as set out at paragraphs 212-214 above, I have concluded on the evidence that was adduced that the water volume and flow were not materially different 'before' and 'after'. Accordingly, since I have found that, contrary to Mr Franklin's assertion, there were no "extraordinary circumstances" here, I consider that his acceptance that the drainage could not cope with the water encountered was an acceptance that it was unfit for purpose.

252. I am in no doubt that the design should have kept the structural elements of the F1/F2 Building away from the large quantities of known groundwater. That would have been possible in two principal ways: the culverting suggested by Landcare, or the construction of the building on a plinth. As to the former, nobody had ever suggested that the culverting option was in any way difficult until Mr Franklin's cross-examination, when the proposition had all the hallmarks of an afterthought. Dr Roberts' answers in cross-examination clearly explained the viability of culverting in this case. I find that, provided it was considered early enough in the design process, culverting was always a viable option: that was why it was suggested (and not dissented from) in the first place, and why, much later, it was the first question raised by Mr Thompson of BCR (paragraph 137 above).

253. Although the plinth alternative initially seemed a little radical, Dr Roberts (the only expert who was a structural engineer) was convinced that it was the right answer. Moreover, his proposal had considerable logic. Ultimately, the only difference was that, instead of designing a perfectly useless undercroft, the concrete beam for the eastern wall would have been raised so as to allow the spring water and groundwater to flow through underneath the F1/F2 Building without doing any damage to the structure itself. It would not have affected the accommodation in any way. It may not

have been so aesthetically pleasing, but it would have meant that, in 2017, the F1/F2 Building would at least have still been standing.

254. In addition, Mr Corrigan's report indicated a number of other solutions which could have been adopted if, as the University maintains, land drains were somehow the answer. The main alternative would have involved keeping water away from the F1/F2 Building by putting the land drains beneath it and laying permeable drainage below the level of the ground beams. That would have prevented water coming into contact with the concrete blockwork. His other option involved doing away with the blockwork altogether and instead having a reinforced beam structure. Mr Corrigan was not cross-examined on any of these other options.

255. For completeness, I should deal with the University's case, identified in the Amended Reply and in Mr Franklin's report, that in some way the system of retaining walls and land drainage was an adequate design to deal with the hydrological conditions at the time of construction. There are two answers to this. First, for all the reasons that I have explained in **Section 6** above, the proposition is incorrect: the design was not adequate at the time of construction. But secondly, the evidence was that it would not have been appropriate to design simply for what the hydrology was or looked like at one particular moment (i.e. on this hypothesis, the time of construction). Mr Franklin agreed that no one should design the drainage on such a basis.

256. On a related topic, there was a good deal of evidence at trial about whether or not the design should have taken on board the water analysis results, particularly the pH and sulphate results. I do not consider this topic to be at the forefront of the criticisms of the design, but I find that the failure to address this issue in 1993-1996 was symptomatic of the slipshod way in which the F1/F2 Building was designed.

257. Everyone was agreed that BRE Digest 363 was the applicable digest. At the time, MCL/Curtins described this water and this ground as a class 1 scenario, in accordance with that Digest. That was a manifest error: it is plain that, because the water was mobile and the site involved made ground, this was at the very least a class 2 situation. This was something which Dr Sims cheerfully admitted during his cross-examination (although not in his report or in his joint statement). The failure to acknowledge a potential problem with the chemistry at the time of the development was a further criticism that could justifiably be made of the design.

258. In addition, there was an express concern at the outset that the conditions posed an increased risk of sulphate attack: see paragraphs 36 and 43 above. Mr Nevill expressly referred to the fact that this was an issue at the time of design when he investigated causation: see paragraph 138 above. I do not accept Dr Sims' attempt to minimise these results by rounding up the figures; the evidence was that the results in 1993/1994 showed that the water was slightly acidic. Yet it does not appear that anything was done about these concerns. Neither was anything done about Mr Webb's subsequent concerns (albeit triggered by site C) about the contact between the water and the blockwork (paragraphs 64-65 above), the very thing which led to the demolition of the F1/F2 Building. He was not apparently satisfied with Curtins' response. Moreover, he was entitled to be concerned, particularly given the lack of specific tests for sulphate in the ground in the area of the F1/F2 Building.

259. I acknowledge that, in accordance with BRE Digest 363, it was only if the water was class 3 that special design measures should have been adopted, and Dr Sims disagreed with Mr Roberts and said that class 3 was not appropriate. Moreover, I regard that as an honest difference between the experts, and did not read into Dr Sims' answers the Machiavellian motives ascribed to him by Mr Taverner in closing. But it is certainly arguable that class 3 was the appropriate classification, because of the concerns that had been raised about sulphate and because, on one view, the blockwork was part of a retaining wall (because the ground was higher on the other side of the undercroft). Dr Sims' remark that "we may now think of it as a basement or retaining wall" suggested that that might not have been apparent at the time, but since there was no change to the design, there did not seem to be any basis for his attempted distinction.

260. Accordingly, I accept that this was a further area of fault or deficiency in the design. It should not be over-stated, because there is at least an element of hindsight wrapped up within this criticism. But the fact remains that, despite concerns expressed at the time, the classification of the water/ground in accordance with the BRE Digest was incorrect and nothing was done to address the particular chemical analysis results that had been obtained at the outset.

9.4 Summary

261. For the reasons set out in detail in **Sections 4 and 6** above, together with the additional points made in the immediately preceding paragraphs, I am satisfied that the primary cause of the damage to the blockwork (but for which, there would have been no cracking or structural failure and the F1/F2 Building would still be standing today) was the faulty/deficient design, and in particular the failure to approach the design of the groundwater drainage in a proactive and strategic way. As a result of this failure, the known and predictable problems with groundwater on this site, and the effect on the F1/F2 Building, were simply not addressed. In this way, the design was not fit for its purpose.

10. ISSUE 4: WAS THE DAMAGE CAUSED BY CONTAMINATION?

262. Although this topic seemed to take up a large amount of the oral evidence, I can deal with it shortly.

263. In my view, the evidence made plain that:

(a) There were probably mineshafts and mine workings underneath this site. They were never found. It is unclear how extensive the unsuccessful efforts were between 1993 to 1996 to locate them.

(b) After the damage had occurred in December 2011, ochreous water and ferruginous material was discovered on site. There was orange staining noted in parts of the undercroft and a mound of ferruginous material near the site of the worst damage to the blockwork.

(c) The most likely source of that ochreous water and ferruginous material was agreed to be old mineshafts. Mr Webb fairly accepted that this was "the best candidate". That is what Arup said (paragraphs 146-147 above). So too did Dr

Sims. So too did Mr Sargent in his first report (paragraphs 151-152 above), and his attempt to resile from that position did him little credit.

(d) Nobody was able to come up with a plausible alternative explanation for the ochreous water or the ferruginous material.

264. Accordingly, I find on the balance of probabilities that there was a source of contamination on this site because the mineshafts which had been identified by British Coal were not located. In that sense, this was another aspect of the faulty/deficient design.

265. However, I am also clear that the damage done by the ochreous water and ferruginous material was limited. There is nothing to say that it did anything more than exacerbate some of the damage that would always have been caused by the leaching and the sulphates in the flowing water. In other words, if you ask the question 'but for the ferruginous material, would this damage still have occurred?', the answer is a resounding Yes. The contamination was not critical to the causation of the damage.

266. Accordingly, had it been relevant, and had the contamination caused by the ochreous water and ferruginous material been the only excluded cause relied on by the defendant, I would not have found that it caused the relevant damage. The contamination exclusion was not therefore applicable.

11. ISSUE 5: THE PROVISO

11.1 Introductory Matters

267. It will be recalled that there is a proviso to the relevant exclusion clause making it clear that damage caused by or consisting of gradual deterioration or faulty/defective design (amongst other things) "shall not exclude subsequent damage which itself results from a cause not otherwise excluded" (see paragraph 8 above). Mr Hickey's opening contained a couple of paragraphs which suggested that the University relied on this proviso. Mr Taverner pointed out in opening that the proviso was not pleaded and he did not deal further with it. No amendments were made to the pleadings. However, Mr Hickey's closing submissions endeavoured to put the proviso centre stage.

268. The main version of his argument was that already noted in paragraph 238 above (albeit with a different twist), to the effect that, whilst the original damage was the damage to the blockwork, the subsequent damage was the cracking and the other damage to the superstructure of the Building. He said that this subsequent damage resulted from the water flowing in and through the blockwork, which was a cause that was "not otherwise excluded". Accordingly, he submitted that the real damage at the heart of the University's case was not excluded, as a result of the operation of this proviso.

269. In his response, Mr Taverner complained about this new case, pointing out that, not only had it not been pleaded, but that, in consequence, the defendant had been denied the opportunity of putting in evidence to deal with it. In particular, he pointed out that Dr Roberts, the defendant's structural engineering expert, could have dealt with some

of the points made by the University in closing, had the matter been properly pleaded in the first place.

270. It is always disappointing when, at the end of a case like this, a pleading point arises. That is particularly true in a case where the issues have always been relatively clear-cut and where both sides have striven to ensure that the evidence addressed those issues. However, because the pleading point has now arisen in stark terms, the court is bound to answer it.

271. The proviso argument was not pleaded. In my view, if the University wanted to rely on the proviso, it should have pleaded it and explained why it was relevant. Although Mr Hickey argued that the proviso was part of the exclusion, so that the burden of proof remained with the defendant, I consider that submission to be unrealistic. The defendant relied on the exclusion clause(s). If the University said that the exclusion clause(s) did not apply because of the proviso, then it was for the University to plead a case to say so. It was hardly for the defendant to plead and prove the negative, that the proviso did *not* apply.

272. Moreover, I agree with Mr Taverner that this topic, had it been up front in the pleadings, would almost certainly have been the subject of expert evidence. I consider therefore that the defendant's objection is not an empty formality, but a point of real substance. The defendant has been denied the opportunity of dealing with this point by way of expert evidence, particularly from Dr Roberts, as it would have wished to have done. In all those circumstances, I rule that the proviso point is not open to the University and cannot now be raised.

273. Inevitably, because I have heard argument about the proviso, and because I may be wrong in my conclusion that this is not a point that is open to the University, I am obliged go on and address the proviso in any event. I do so conscious of the point in the previous paragraph, namely that the evidence is not as full as it would otherwise have been if the issue had been pleaded in the first place.

11.2 The Law

274. The principal case relied on by Mr Hickey in respect of the proviso was the Australian case of ***Prime Infrastructure (DBCT) Management P/L v Vero Insurance Ltd*** [2005] 2 CA 369. In that case a machine had an internal fatigue crack due to a defective weld. That crack had grown progressively worse over time until eventually the machine collapsed. As a result of the collapse the machine itself and the conveyor belts below were extensively damaged. The Court of Appeal held, by a majority, that the failure of the weld amounted to 'initial damage' and the collapse of the machine was 'subsequent damage' and therefore fell within the proviso. They held that 'subsequent damage' was damage after the 'initial damage' and did not need to be distinct, independent or separate from the initial damage.

275. I am bound to say that I find that decision somewhat surprising. It seems to me to draw a potentially artificial distinction between initial and subsequent damage. I consider that the dissenting judgment of Jerrard JA (starting at paragraph 44) to be more in line with general principles. Moreover, I note that, when discussing this case in his book, Paul Reed QC at paragraph 26-107 notes that two other courts have reached a very different conclusion on similar clauses, holding that such subsequent

loss must be caused by a non-excluded peril separate and independent but resulting from the original excluded peril: see ***Acme Galvanised & Co Inc v Firemans Funded Insurance Co*** 221 Cal. App.3d 170 at 179 and ***Weeks v Co-Operative Insurance Cos*** 149 N.H 174 at 177. So, since none of these three cases is binding on me, and the law which they embody is in any event far from clear, I consider that I should approach the operation of the proviso from first principles.

276. First, it seems to me that 'subsequent Damage' must be a reference to different damage: damage that can be distinguished in some way from the damage originally caused. Second, because that different damage must be caused by something which is "not otherwise excluded", that must mean a new or different cause to the gradual deterioration or the faulty/defective design. It must mean a new or different cause because it is a cause not otherwise excluded and, as we know, gradual deterioration and/or faulty/defective design are both causes which are excluded.

277. In my view, the sort of situation that the proviso is intended to cover is, let us say, the collapse of a factory wall because of a faulty/defective design. The falling masonry breaks open a gas pipe, which causes a fire that destroys some adjacent houses. Whilst a claim for the cost of repairing the factory would be excluded (because of the faulty/defective design), the claim for repairing the buildings damaged by the fire would be a claim in respect of subsequent damage caused by something (a fire) not otherwise excluded, and would be recoverable under the policy.

11.3 Analysis

278. In my view, we are a long way from that sort of situation in this case. First, I do not accept that there is subsequent or different damage. I have already explained that, in my view, the damage in this case was all of a piece: the damage to the blockwork robbed it of its structural strength, causing the visible damage by way of the cracking to the superstructure above. That is not different damage; that is all part of the same damage, the cause of which was an excluded cause(s). I derive support for this conclusion from Dr Sims, who described the cracking of the superstructure as simply the sign that "alerted everyone to the problem".

279. During the evidence, there was an attempt by Mr Hickey to run a rather different case on subsequent damage. This time it related to the blockwork. He cross-examined Dr Roberts on the basis that the initial damage was just to the blockwork in the middle section of the eastern wall, and that everything else – including the damage to the other blockwork on either side - was subsequent damage. Dr Roberts completely disagreed with that, saying that whilst the middle section was the location of the worst damage, there had been significant damage to the blockwork "on almost the whole length of the eastern wall and around a little bit on the northern end". So, whilst he agreed that the damage to the blockwork was more severe in the central location, he did not agree that the blockwork was only damaged in that section.

280. Moreover, this explained why Dr Roberts was sympathetic to the view that the whole F1/F2 Building had to be demolished. He agreed, in answer to a question from the court that, if only the middle part of the eastern wall had been damaged, the F1/F2 Building could have been saved. That fits in with the underlying basis of the University's claim, which was to the effect that the blockwork was damaged beyond repair such that the F1/F2 Building could not be saved. Accordingly, I find that the

alternative case on subsequent damage was not supported by any evidence, was contradicted by Dr Roberts (who was the only expert who gave evidence on this topic), and was contrary to the University's underlying claim.

281. Despite all of that, in paragraph 2 of Mr Hickey's closing Aide Memoire, he argued that:

> "The blocks that deteriorated if they had been found before the damage ensued could have been replaced – but the damage done to the Building in 2011 is covered. Though there were 'damaged' or weak blocks, the Building failed because it was affected by the fortuity of what occurred in 2011 as the result of flowing spring water."

Picking the bones out of that, I think that what he was suggesting was that the damaged blockwork could have been replaced in August 2011, but the subsequent damage – presumably to the other blockwork and to the superstructure above, which it is suggested occurred on or just before 13 December 2011 – was covered by the policy.

282. I do not accept that submission for a number of reasons. Not only is it not pleaded, but I consider it to be precisely the sort of allegation which, if the University had wanted to run, would have required expert evidence to establish. There is no evidence to support the submission that, if the damaged blocks had been found before 13 December 2011, they could have been replaced, whilst the wall (and the F1/F2 Building itself) could have been left safely intact. That involves temporal questions and structural matters which could only have been addressed by the experts. When does the University say that the blockwork moved from being replaceable to being so damaged that the entire F1/F2 Building had to be demolished? What is the evidential basis for such an argument? There were no clear answers to these questions.

283. For the avoidance of doubt, I find that, on the evidence that was adduced, it could not be said that the worst of the blockwork could have been replaced in August 2011, but was so far gone in December 2011 that it sealed the fate of the entire F1/F2 Building. Dr Roberts, who gave the only relevant evidence on this topic, was adamant that this was not the case. In my view, this entire argument about subsequent damage was an afterthought, perhaps prompted by the realisation that the University's expert evidence on the pleaded disputes had manifestly not established the claim.

284. Furthermore, even if I am wrong about this dispute, and either the damage to the other blockwork or the damage to the superstructure of the F1/F2 Building qualifies as subsequent damage, it makes no difference to the outcome. This is because such subsequent damage was not caused by something which was 'not otherwise excluded'. The cause of all the damage to all parts of the F1/F2 Building was the inevitable consequence of the flowing groundwater on the blockwork, and I have explained why that was an excluded cause both as 'gradual deterioration' and/or as 'faulty or defective design'. There was no other cause which gave rise to the subsequent damage. Again, therefore, the proviso does not apply.

285. Finally on this point, I should refer to exclusion 7, set out at paragraph 8 above. That excluded damage to buildings "caused by their own collapse or cracking unless

resulting from a Defined Peril insofar as it is not otherwise excluded". If Mr Hickey is right to say that the cracking is different damage to the damage to the blockwork, then that damage (i.e. the cracking) was caused by the movement and partial collapse of the F1/F2 Building. That would also be excluded, this time by operation of exclusion 7, "unless resulting from a Defined Peril". The only Defined Peril here which was pleaded is the flood, and that was what Mr Hickey relied on in his closing submissions. But, for the reasons set out in paragraphs 209-211 above, I have rejected the case that the damage was due to a flood. So, even if Mr Hickey was right about different damage, the claim would then be excluded by operation of exclusion 7.

11.4 Summary

286. For the reasons set out above, I do not consider that the proviso has been pleaded and is therefore not properly before the court. If I am wrong about that, I do not consider that the proviso applies, either because there was no subsequent damage, or because any subsequent damage was not caused by a cause "not otherwise excluded", or because it was excluded by operation of exclusion 7 in any event.

12. CONCLUSIONS

287. For the reasons set out in **Section 7** above, I find that this is not a case of accidental damage, so the claim fails.

288. For the reasons set out in **Section 8** above, I find that, if this was a case of accidental damage, it was excluded by operation of the exclusion for "gradual deterioration".

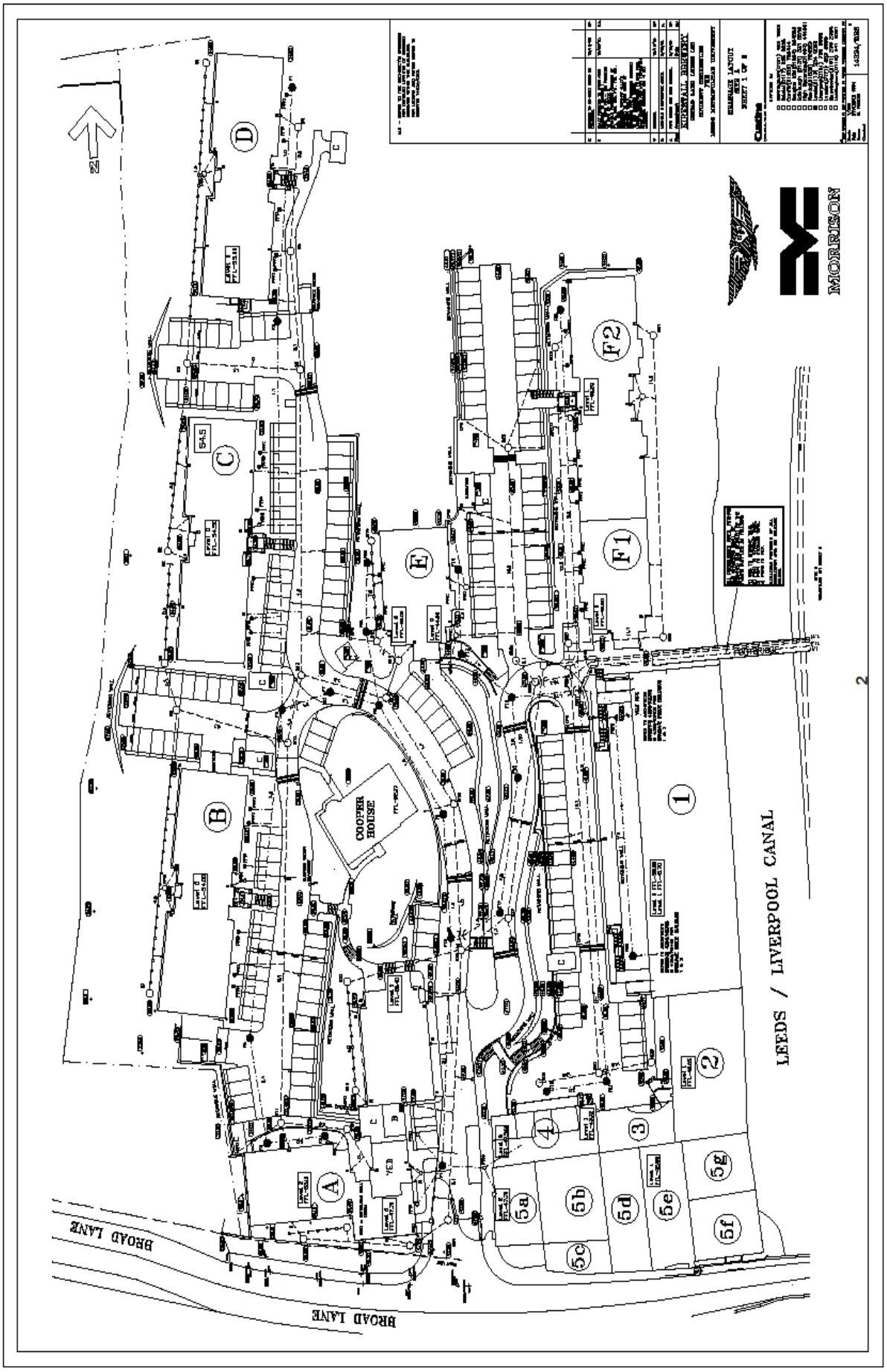
289. For the reasons set out in **Section 9** above, I find that, if this was a case of accidental damage, it was excluded by operation of the exclusion for "faulty/defective design". I stress that, in my view, this was the best of all the arguments available to the defendant in this case.

290. For the reasons set out in **Section 10** above, I do not consider that this is a case where the damage was caused by contamination. The exclusion in relation to contamination is therefore irrelevant.

291. For the many separate reasons set out in **Section 11** above, I reject the University's case advanced in reliance upon the proviso.

292. For all these reasons, the University's claim against the defendant is dismissed. I will deal with all consequential matters at the handing down of this Judgment.

FIGURES 1, 2 AND 3 IN SEQUENCE BELOW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COOPER HOUSE
LEEDS / LIVERPOOL CANAL
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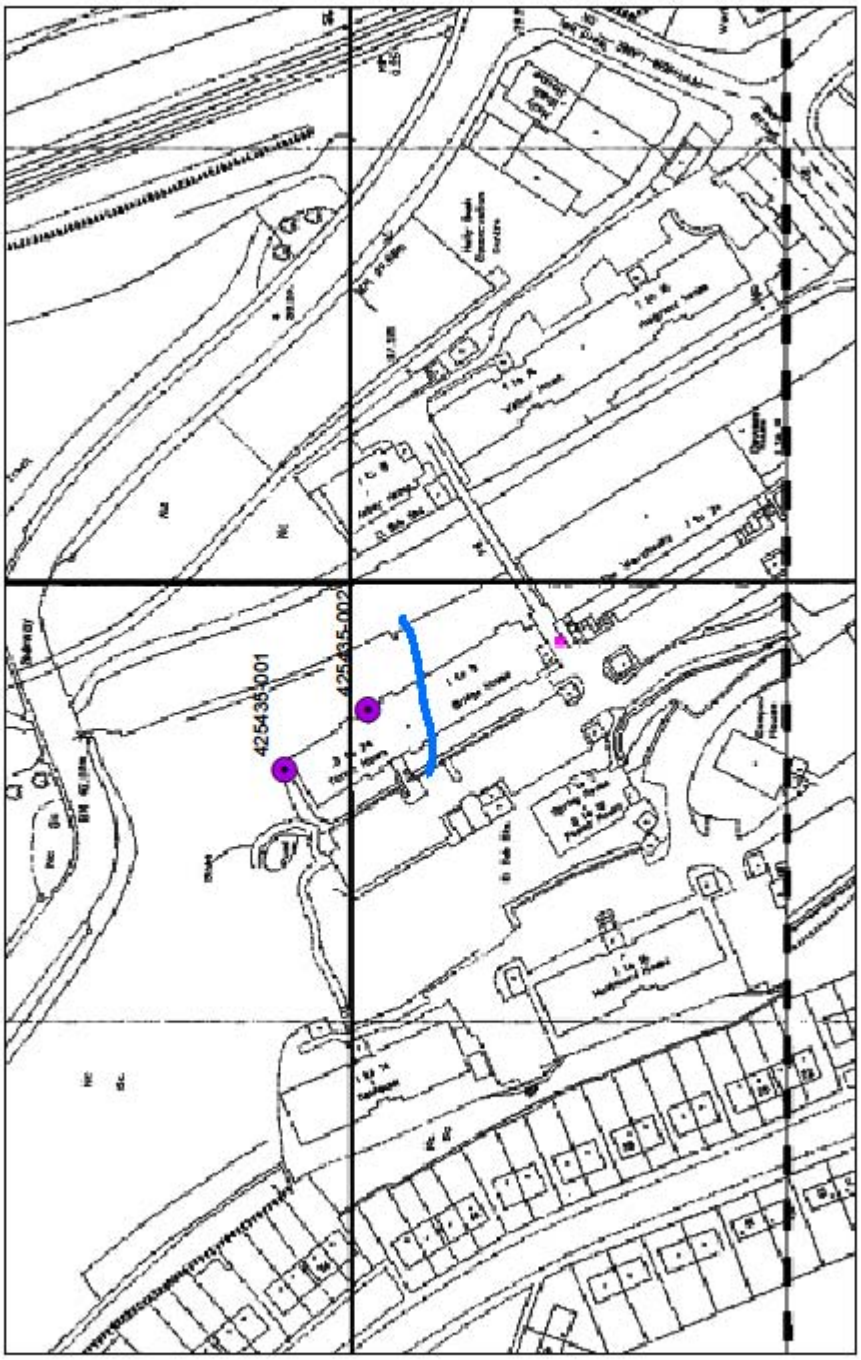
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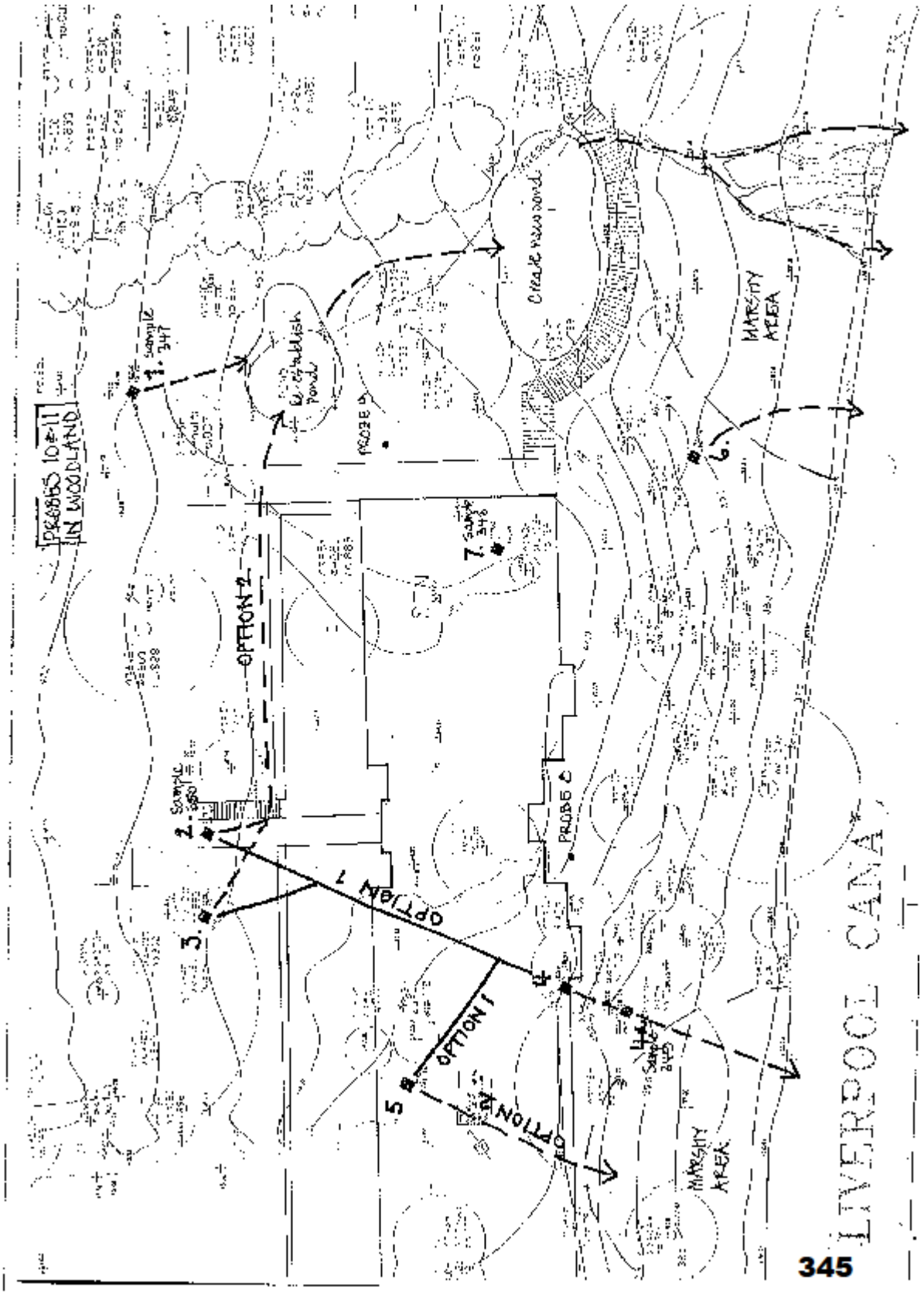
PROBES 10 & 11
IN WOODLAND
1. Sample 347
PROBE B
Creek
MARSHY AREA
2.
7. Sample 348
OPTION 2
2. Sample 350
3.
PROBE C
OPTION 1
4
Sample 349
5
OPTION 3
MARSHY AREA
LIVERPOOL CANAL
345