Neutral Citation: [2013] IEHC 56

THE HIGH COURT

[2009 No. 1201 P.]

BETWEEN

NEIL MCELENY, KATHLEEN MCELENEY, KATIE MCELENEY (A MINOR SUING BY HER MOTHER AND NEXT FRIEND, THE SECOND NAMED PLAINTIFF) AND CONOR MCELENEY (A MINOR SUING BY HIS MOTHER AND NEXT FRIEND, THE SECOND NAMED PLAINTIFF)

PLAINTIFFS

AND

THE COUNTY COUNCIL OF THE COUNTY OF MAYO AND SHELL E&P IRELAND LIMITED

DEFENDANTS

THE HIGH COURT

[2009 No. 8151 P.]

BETWEEN

NEIL MCELENY, KATHLEEN MCELENEY, KATIE MCELENEY (A MINOR SUING BY HER MOTHER AND NEXT FRIEND, THE SECOND NAMED PLAINTIFF) AND CONOR MCELENEY (A MINOR SUING BY HIS MOTHER AND NEXT FRIEND, THE SECOND NAMED PLAINTIFF)

PLAINTIFFS

AND

ROADBRIDGE LIMITED

DEFENDANT

JUDGMENT of Mr. Justice Gilligan delivered on the 24th day of January, 2013

Introduction

1. The plaintiffs in these proceedings effectively claim damages in negligence nuisance and for breach of the Constitutional right to property and/or the inviolability of the dwelling house and for breach of legitimate expectation for loss, damage, inconvenience, distress and interference caused to the plaintiffs as against the defendants herein. The claim relates to the plaintiffs' former family home at Aughoose, Pullathomas, Ballina in the County of Mayo. The plaintiffs' property is situated in an area located near the controversial Shell Corrib gas pipeline.

2. The property, known as Cuan na Farraige comprises some 5,000 square feet of accommodation on Mayo's Atlantic Coast and was operated as a guest house by the plaintiffs, with extensive guest facilities such as day rooms and en-suite bathrooms provided.

3. The plaintiffs contend that as a result of excessive heavy goods vehicle traffic on the public road adjacent to the property in the summer months of 2008, significant vibration damage was inflicted to their property to the extent that it is no longer habitable. As a result of this damage, the plaintiffs, in essence, seek the value of the property, less the site value by way of damages. Initially a claim in excess of €1m was sought, however commonsense has prevailed in respect of the monetary claim now being advanced.

4. The first and second named defendants deny the claims advanced by the plaintiffs, contending that the levels of traffic which passed on the road adjacent to the property are incorrect and exaggerated by the plaintiffs, and that alleged vibration damage as a result of heavy goods vehicle traffic could not have caused the cracks to the structure of the property.

5. Originally, the plaintiffs issued two separate sets of proceedings, which were later consolidated pursuant to an order of this Court on 16th May, 2012. Roadbridge have taken over the handling of the proceedings on behalf of Shell E&P Ireland Limited. In essence there are two defendants, the County Council of the County of Mayo and Roadbridge with and on behalf of Shell E&P Ireland Limited.

6. Mayo County Council are the local authority for the functional area of the County of Mayo and are sued as a local authority, having the capacity as a roads authority and planning authority and are further sued as a road user and a legal person. Shell E&P Ireland Limited is a limited liability company and, at all material times, was engaged in the construction and development of works in conjunction with the Corrib Gas Project and were engaged in road operations in conjunction with the said development.

7. The plaintiff's property was built originally in or around 1901 by the Congestive District Board and within a few years an extension was built subsequently, which is now referred to as "the Lace school". The property was formerly in the ownership of Gaeltarra and in 1977 a large extension was constructed, with another extension being built in 1983 for the purposes of creating a knitting centre. The property was purchased by the plaintiffs in 1996 for a sum in the region of IR£50,000 and planning permission was sought for a change of use from lace making to a diving and outdoor pursuit centre. The change of use was granted and the plaintiffs took up residence in the house and added two small extensions. The house itself had been left vacant for a period of approximately 11 to 12 years prior to the purchase by the plaintiffs, and the first named plaintiff, who has a long history and experience of working in the construction sector effectively repaired the house to a habitable standard after purchase. He claims that during the course of the renovations there was no evidence of any structural defects.

8. The roadway outside the plaintiff's property as described by Mr. Ó Conaire is a very rural road which is quite narrow in front of the plaintiff's property. It is a typical township type road in a rural setting and because of the narrow width of the road the traffic tended to travel in the middle of the roadway as opposed to having two distinct lanes. In Mr. Ó Conaire's view it was suitable for normal type traffic but would not have been up to a standard where large scale haulage would be carried out. The house itself is located approximately seven metres from the L1202 road which is used for travel to the Glengad infill site where Shell were carrying out certain works in connection with the Corrib Gas Pipeline.

9. In 2006, the second named plaintiff was given a site approximately a mile from the property in question, and after having obtaining planning permission, the plaintiffs began construction of a new house on this alternative site. Their intention was to move into this house when constructed and to sell the property in question. In 2007, the property was placed on the market with local auctioneers with a price varying in the region of €600,000 to €700,000. The price was later dropped to a minimum price of €460,000 but as events transpired, no bid was ever made on the property. In or about February 2008, the first named plaintiff became concerned about the amount of heavy goods vehicles that were passing his property on the road adjacent to the front of the house. Despite contact with various persons in Mayo County Council, the first named plaintiff contends that he received no adequate response.

10. In April 2008, in response to a letter received from Terry Nolan, Deputy Managing Director of Shell, the first named plaintiff wrote complaining that his Bed & Breakfast facility, despite being in close proximity to the Shell terminal, had failed to obtain any business from Shell or its employees. In response to this, Mr. Nolan wrote expressing his disappointment that the plaintiffs' B & B had not gained any real benefit from the Shell Project and offered to meet him at his convenience. Subsequently, Pascal Doherty, the appointed selling agent for the plaintiffs' property wrote to Mr. Nolan to ascertain if Shell would be interested in purchasing the property. Shell had no such interest.

11. The construction of the new house was completed in 2010 and the plaintiffs moved to live there. Since then, the property, which is the subject matter of these proceedings, has lain vacant without any provision for heat or ventilation. It is clear a number of cracks exist both on the external façade of the building, and also in the interior. At present, the property appears to be in very poor condition as indeed would any property left vacant, unheated and unventilated on the Atlantic coast of the West of Ireland.

12. In submissions made to the court, the plaintiffs argue that a scheme of extensive haulage operations, relating to work being undertaken by both defendants, allowed for an excessive number of heavy goods vehicles to travel on the public road adjacent to the front of the plaintiffs' property. As a result of this increased traffic, which the plaintiffs allege occurred from mid June 2008 until the 2nd August 2008 vibration waves stemming from the weight of the loads carried by these vehicles caused cracks to appear in the surface and interior of the property. In evidence, the first named plaintiff describes the situation at a time of mid June to late June 2008, when lorries started passing his house in convoys of fives, sixes and sevens with no control. At one point in his evidence, the first named plaintiff describes convoys of seven lorries, some of them eight wheel articulated lorries in excess of forty tonnes flying past the plaintiff's property at probably 70km or 80km an hour with no Garda Síochána, no lead patrol, nothing, nobody from Roadbridge. The first named plaintiff went on to state that in the first week in July, he and his wife noticed four dirty cracks along the front of the house and cracks started to appear on the inside of the house, not as dramatic as those in the front of the house. On average, the first named plaintiff indicated to the court that there would be anywhere between 90 and 120 lorries per day and you could double that as they had to return from the Glengad site having delivered their load. The first named plaintiff through his solicitor complained in a letter of the 21st July of the excessive heavy vehicular traffic passing on the roadway outside his house and at this stage, as already indicated herein, he was complaining of severe cracking to his property. Mr. McEleny was quite clear in his evidence that he was conveying the impression that by the 21st July, 2008, there was a continuous flow of vehicles from 5.45am until 9.00pm with the convoys containing anything from five to seven vehicles. In essence, Mr. McEleny conveys the impression that there were serious numbers of vehicles travelling in convoys past his house every day. Mr. McEleney confirms that there was a dramatic increase in the passing vehicular traffic in the last week of June and the beginning of July.

13. The defendants contend that the relevant dates that the alleged excessive road traffic occurred, and the number of the vehicles involved in this use, are incorrect and/or greatly exaggerated by the plaintiffs.

14. Primarily, it is necessary to ascertain the factual range of dates on which the road usage by the defendants' is alleged to have occurred, along with the amount of heavy goods vehicles used in those endeavours.

15. The plaintiffs maintain that the works in Glengad as carried out by Shell occurred prior to the 8th of July, 2008, and it is my view that they are mistaken. When asked as to the precise time the works in Glengad occurred the first named plaintiff stated that they commenced in mid to late June, 2008. He also stated that he first noticed the cracking in the house at the end of June or the beginning of July. However, no works by Mayo County Council were taking place in the vicinity of the plaintiffs' property. Prior to the beginning of July, Mayo County Council were carrying out some works to the road leading to the Glengad site, but not actually near the vicinity of the plaintiffs' property or necessitating the traffic to pass the plaintiffs' property. Evidence was furnished by Shell and Roadbridge showing that no deliveries or works were initiated by them until the 8th of July. Even though these facts were disputed by the plaintiffs, they did not furnish any evidence to the contrary to show that the second named defendants initiated any haulage works, prior to 8th July, 2008.

16. The plaintiffs also alleged that a significant number of lorries, between 90 and 120 per day, were going past their house and initially the first named plaintiff stated that the heavy volume of traffic began in mid June, and then at the end of June or during July through to the first week of August. This was his general impression rather than being particular in respect of any specific date. In defence to this, Shell produced documented figures showing the number of trucks passing from the 8th of July to the 21st of July and only on one of the days did the number of trucks run into double figures and in fact this figure pertains up to the 29th July, 2008. While the first named plaintiff disagreed with these figures, and indicated that he would refer to certain notes he had taken in order to resolve the situation, the matter was never re-visited. Furthermore, the plaintiff did accept that if the Shell/Roadbridge figures were correct in relation to the vehicles passing the property up to the 28th July 2008, it would have been unlikely that the number of vehicles would have caused any intensification, let alone, damage and he agreed you would have to look to something else to have caused the structural damage.

17. Kathleen McEleney, the second named plaintiff and wife of the first named plaintiff, took the view that the documentation produced by Shell was not consistent, nor did she accept that it was accurate. Overall, while the plaintiffs took issue with the produced figures, no serious threat against the content of the figures ever manifested itself. Thus, the reality of the situation is, that despite a considerable amount of time spent in evidence on this particular aspect, there was no Roadbridge/Shell traffic of any significance on the roadway outside the plaintiffs' house prior to the 8th of July, and that between the 8th July and the 29th of July there was only one day when the number of shell vehicles went into double digits being to the extent of 11 vehicles passing the property.

18. I am satisfied, that the evidence of the first and second named plaintiffs in relation to the extent of the vehicular traffic does not stand up to scrutiny insofar as they maintain that cracks began appearing in their property as a result of vibration damage in late June, early July 2008. In order for this contention to be valid, it would have to have been the vehicular traffic of Mayo County Council which caused the damage. From the evidence of Mr. Tom McDonnell, which I accept, it is quite clear that no work was carried out by Mayo County Council which would have required the passing of vehicles on behalf of Mayo County Council on the roadway outside the plaintiffs' property prior to the beginning of July 2008. Furthermore, I am satisfied that the number of trucks which passed and re-passed the roadway in question from early July 2008 never exceeded 25. During the critical period of the 8th July to the 21st July, there were no more than 36 lorry movements on any given day when the figures given by Roadbridge/Shell and Mayo County Council are combined.

19. I am driven to the conclusion that both the first and second named plaintiffs are mistaken regarding the traffic movements alleged by them during the relevant period. The evidence simply does not support their contention in this regard.

20. I now turn my attention to a more critical matter, namely the expert engineering evidence adduced before the court contending on the plaintiffs' behalf that the cracks in the plaintiffs' property were as a result of vibration damage caused by the vehicles of the defendants or either of them passing and re-passing on the public roadway.

21. Other than a vague suggestion of a linear crack in a public house adjacent to the roadway between the plaintiffs' property and the Glengad site, there is no evidence that any other property along the roadway suffered vibration damage and no evidence that any other property has made a claim against the defendants for vibration damage to their property.

22. I take the view that a reasonable conclusion from the totality of the engineering evidence adduced before the court, is that incidents of vibration induced damage to properties adjoining public highways by passing vehicular traffic would be extremely rare if not virtually unknown.

23. Expert analysis on behalf of the defendants to support this view as to the rarity of vibration damage of this nature was offered by Dr. David Hillar who holds a PhD in Ground Borne Vibration from construction works and has worked for many years in the United Kingdom Department of Transport and Environment, and his expertise in the ground engineering division is specifically related to research on ground borne vibration. He is now leader of Arup's Acoustics practice in Manchester specialising in noise and vibration work. His qualification and expertise as a vibration expert are not seriously challenged, nor, in the court's view, could they have been.

24. Dr. Hillar referred to studies as carried out and, in particular, in respect of one of the studies where a house was exposed to a simulated passage of 3.5 million heavy goods vehicle axles which equates to 875,000 4 axle tipper trucks. The result of the study was that there was almost no effect on the buildings, save for some very minor hairline cracking within the plaster finishes within the building. Dr. Hillar explained that this study however had no real comparison to the alleged damage which occurred to the plaintiffs' property at Pullathomas. He made reference to two other studies to strengthen his contention and when specifically asked about his experience of alleged vibration damage caused by passing vehicular traffic he stated he had never come across a case of vibration damage where vehicular traffic was the cause of such damage, stating "he was not aware of any instances where there is evidence of traffic vibration causing building damage" and he indicates that this is both in relation to his own experience and from what he has read in the literature. Dr. Hillar further confirmed that in the United Kingdom the conclusion of TRL Research Report 246 is to the effect that there is no known case of heavy goods vehicles causing vibration damage to any building and he is not aware of any such case. Dr. Hillar further confirms that there is nothing in the literature to suggest that heavy goods vehicles travelling on a road founded on peaty soil could cause damage to buildings located in the immediate vicinity of a road.

25. Dr. Hillar refers to the criteria which he has used as taken from the British Standards which give guidance in terms of Peak Particle Velocity measured in units of millimetres per second, and for residential buildings he says there is a chart and a table which show a frequency dependent vibration starting at 15mm per second at 4 hertz and increasing with increasing frequency up to 50mm per second at higher frequencies. In addition, there is also some text which states that on the basis of a lot of evidence from case histories and experimental research there is a tendency towards zero damage at about 12.5mm per second, and that number tends to be latched upon as a useful single figure. Above the figure of 12.5mm per second the standard indicates that "one may" get cosmetic damage but anything lower than 12.5mm is tending to zero in terms of the likelihood of causing damage to a building. Dr Hillar made reference also to a small number of tests conducted by him at the McEleney property more recently. The result of Dr. Hillar's tests at the front façade of the property due to heavy goods vehicles passing resulted in a finding of 0.8mm per second, and basically the results of the tests as carried out fell very substantially short of anything remotely close to the figure which would be necessary to cause vibration damage. I do not place any significant weight on the results of the tests as I am satisfied that they were not like with like but quite clearly the necessary level of vibration required to cause actual damage to an adjacent building is very substantial and probably explains why there are no actual recorded cases. I also note in particular Dr. Hillar's comment to the effect that when a person is standing on the road and a large vehicle passes, as a human it is perhaps understandable that you would perceive the effect of that vehicle in a rather dramatic way, and that is something that is borne out by both Dr. Hillar's experience and by the research because a number that is usually used to understand people's perception of vibration in PPV terms would be 0.3mm per second and you could feel vibration at that level if you were exposed to it whereas, as previously indicated, for a building the level is 12.5mm per second. Dr. Hillar estimated that the PPVS to which the property would have been exposed as a result of the construction heavy good vehicles passing was in the region of 0.8 to 1.8mm/s. This is much the same order of magnitude as the measurement data that was previously reported on by a separate company SDS, and these predictions are very much smaller than the criteria for any risk of building damage given in BS7385: Part II.

26. Further, Dr. Hillar accepted that although the vibration was small at the predicted PPVS, it would be expected to be felt by residents within the property and, therefore, could give rise to concerns that damage may result and this is a common and understandable reaction but is a misunderstanding of the actual situation. Dr. Hillar concludes that the vibration to which the property was exposed would not have been at a level that would present a risk of damage, even cosmetic damage to the building. I note in particular Dr. Hillar's conclusion that he does not consider that there was any need to take measures to restrict traffic vibration due to a risk of damage to the property.

27. The rationale for including the evidence of Dr. Hillar at this point in the judgment is to illustrate that at all times, any engineer retained at the behest of the plaintiffs had to be aware, if nothing else from the technical literature involving the subject matter, that it was unlikely that any damage being complained of by the plaintiffs to their property, was caused by passing vehicular traffic. Thus, if the case was going to be made in a court of law, that damage as seen was caused as a result of vibration from passing vehicular traffic on the public highway a qualified expert with expertise in these matters and with an in depth knowledge of vibration needed to be consulted. This is especially apparent where the technical literature is apparently devoid of examples of passing vehicular traffic on a public highway causing damage to adjoining property.

28. The basis of the case made out by the engineers who gave evidence on behalf of the plaintiffs is that, in general terms, the cracks as seen in the plaintiffs' dwelling house were of a structural nature and were caused by vibration of continuous heavy vehicular traffic passing on the adjacent roadway.

29. In order to advance this theory, the plaintiffs' secured the analysis of three separate engineers; Mr. Ó Conaire, Mr. Mooney and Mr. Crotty. The defendants in turn relied upon the testimony of Dr. David Hillar and an engineer, Mr. O'Flaherty.

30. The initial engineer retained by the plaintiffs to survey the plaintiffs' property was Colm Ó Conaire, a Civil Engineer and a Chartered Engineer with the Institute of Engineers of Ireland and he carried out an inspection of the property as early as the 12th August, 2008. It was stated in his report and in evidence that the report itself, its findings and the recommendations contained within it were based on a visual inspection only on the condition of the property on that day and on the factual circumstances as outlined to him by the plaintiffs.

31. Much of his report dealt with the condition of a boundary wall, which suffered significant damage and which was replaced by Mayo County Council, and the condition of which is not in contention at this time. Mr. Ó Conaire in his evidence in discussing the Lace Factory premises and in particular the front wall describes a lot of cracking as of August 2008 which could be classified as hairline to slight. He took the view that the pattern of cracking was of concern and it suggested that there was an underlying structural cause. He describes in his evidence that as a structural engineer you would map the cracks and then you have to make a call on whether there is an underlying structural distress that induced the cracks. For example, he stated that you could have thermal or shrinkage cracking and that there are numerous other types of cracking and that the role of the structural engineer is to make a judgment on the type of cracking, the location of the cracking, the type of structure that the cracks had occurred in and to pull all that information together and make a judgment on the integrity of the building itself.

32. Mr. Ó Conaire's was of the view that due to the nature of the cracks, notably those found in the attic of the property, and on the chimney breast, that the most likely cause of the cracks was subsidence. However, due to the recent sequence of events, as mentioned to him by the plaintiffs, he took the view that the subsidence may have been induced by the vibrations from uncharacteristic traffic movements of heavy goods vehicles on the public roadway outside the property. He made a number of recommendations namely, to put into place a crack monitoring programme to keep abreast of any changes in the cracks, and to record the vibrations during any further road haulage activities in the vicinity of the property. He also recommended soil characteristics be taken and to put into place a programme of remedial construction in order to reinstate the area around the chimney breast and attic. Dry lining was given consideration in places where practicable and it was his overall recommendation that replacement of the retaining wall, repair works to the defects noted in the attic, the recording of vibrations in the vicinity of the house when haulage activity resumed and, in particular, a base line of vibration levels under normal traffic condition should be recorded, along with installation of tell-tales at selected crack locations and the regular recording of the crack movements. He also recommended that the condition of the cracks be monitored on completion of remedial works to the front boundary wall to establish the final extent of the cracking to the structure and to ensure that the cracking had stabilised.

33. It was also Mr. Ó Conaire's opinion that a phenomenon known as secondary consolidation could have occurred based on the type of soils found in the vicinity of the house and its foundation. Secondary consolidation entails the slow consolidation of the soils over a period of seven to eight years to the point where it reaches equilibrium. This is particularly relevant to peat, on which the property in question is founded.

34. Other than the installation of a new retaining wall, it is evident, unfortunately, that Mr. Ó Conaire's recommendations were not followed. This is significant as Mr. Ó Conaire was of the view that subsidence had occurred and that it may have been induced by the vibrations of the defendants' works.

35. Arising from a subsequent visit by Mr Ó Conaire, in June 2010, he was of the view that the erection of a new retaining wall eliminated the very serious risk of damage to the property, and of potential damage that could have occurred. He noted that the cracks in the attic area above the Lace Factory had not shown any sign of new crack locations. However, new cracking had appeared at locations throughout the structure, which, in turn was causing rising damp, water ingress and damage to the roof to occur. He was at this time recommending the underpinning of all the external walls, roof repairs and a general programme of repair construction.

36. Mr. Ó Conaire as an engineer can only rely on the factual information given to him by the plaintiffs. The Court has found that the level of traffic on the road adjacent to the property was neither unusual or excessive up to the 21st July, when considerable cracking is alleged by the plaintiffs to have been in place, and I am of the view that the evidence of Mr. Ó Conaire is based on an incorrect factual premise.

37. Mr. Ó Conaire correctly recommended, after his initial visit, that a battery of investigative procedures be undertaken so as to ascertain the vibration levels and other relevant readings. This was not followed, and as a result, Mr. Ó Conaire accepted that he was unable to give an opinion as to how the vibrations may have allegedly travelled from the road to the house. Furthermore, it appears on that on the initial inspection, Mr. McEleney was indicating locations where new cracks had occurred so that all cracks were not categorised in the same manner, yet, no consideration is given by Mr Ó Conaire to the nature and extent of any pre-existing cracks and to what caused them, in comparison to the alleged new cracks. Similarly, he placed considerable attention on a crack above the porch and to the left of the two storey dwelling house and, effectively, made the case that this was caused by vibration damage and was the cause of the dampness found in the kitchen, yet, no test was ever performed by Mr. Ó Conaire to confirm this nor did he carry out any detailed examination of the crack to confirm this assertion. This is the only crack at the front of the two storey building and is allegedly caused by vibration damage. While I accept that Mr. Ó Conaire explained that in his opinion the difference in respect of the two structures was the mechanism involved in the construction of the building, the two storey building being built initially and the Lace Factory addition following based on an arched construction thereby weakening it, I take the view that the evidence is undermined because, in essence, the plaintiff is saying that the secondary consolidation occurred to the ground underneath the Lace Factory but yet on the opposite side of the chimney breast in the bedroom of the two storey building there is no evidence of any significant cracking or subsidence damage, even after subsequent inspections carried out.

38. Taking the entirety of Mr. Ó Conaire's evidence into account, including his engineering qualifications, the manner in which he initially inspected the property, and, in particular, the recommendations which he correctly advised and which unfortunately were not adhered to, I do not accept that his conclusion can be relied on as a determining factor to decide this issue in the favour of the plaintiffs.

39. Mr. John Mooney, Consulting Engineer, was also retained on the plaintiffs behalf and it is important to note that Mr. Mooney was not and does not profess to have the requisite experience in assessing vibration induced damage to a roadside property caused by

passing vehicular traffic. Once more, the inspections carried out by Mr. Mooney were inspections of a visual nature and he also did not carry out any tests. Surprisingly, although Mr. Mooney attended and inspected the property after Mr. Ó Conaire had done so, he was never informed of Mr. Ó Conaire's involvement in the matter. Furthermore, he was unable to give any definitive timescale as to when the cracks in the attic of the Lace Factory may have occurred and in the course of his evidence estimated that the cracks could have been in existence for even up to three years.

40. Mr. Mooney was of the opinion that by September 2008, the dampness in the premises was significant. He was also of the view that cracks in the front elevation, which he inspected in September 2008, had not increased by the time of his third inspection on the 26th June, 2012. There was an increase in some cracking but much of the cracking remained the same. No cracks at all had extended from 2mm to 5mm.

41. Mr. Mooney stated that the cracks to the front elevation of the Lace Factory and the attic wall were consistent with significant vibration damage. However, as he did not carry out any relevant tests or have any appropriate experience in this type of damage, the court cannot rely on Mr. Mooney's evidence to draw a conclusion on this aspect of the case.

42. The final expert retained by the plaintiffs was Mr. Tom Crotty, Consulting Engineer, who attended at the property for the first time on the 11th July, 2012, during the course of the hearing. Mr. Crotty graduated from UCD with a Bachelor of Engineering Degree in 1977 and subsequently did an MBA in the University of Limerick in 1993. He is a chartered member of the Institute of Engineers and during his employed life worked for Home Bond. He was advised by the plaintiffs of the damage they felt was caused to their property as a result of the construction traffic and he relied on it. He accepted that the house had previously been inspected by the two engineers mentioned previously and he was furnished with copies of their reports and the defendants' expert reports. At his inspection he was accompanied by the first named plaintiff and Mr. Colm Ó Conaire, Consulting Mechanical Engineer.

43. Mr. Crotty's inspection of the property differed from any of the other consulting engineers in that he was the only one who performed a number of tests on the premises to ascertain the nature of the damage. He describes the state of the buildings, noting that he did not consider that the older buildings was founded on material that could be considered suitable by current day standards. He explained that the first named plaintiff arranged for a number of trial holes external and internal, in both the two storey dwelling house and the Lace Factory, and that he examined these excavations accordingly. He noted a significant number of cracks in the building, both internally and externally, and was advised by Mr. McEleney that these were caused to appear in July 2008, as a result of the heavy traffic outside his home.

44. Mr. Crotty is of the view that he cannot see any other factor other than the traffic, which could have caused the cracking in the walls. He refers also to the fact that dynamic compaction of the soft clay underlying the peaty material below the house may also have occurred, which was caused by the shockwaves arising from the trucks bearing down on the road. This would cause significant increases in pore water pressure in the silty clay with subsequent consolidation of the soft clay material. In addition to this, secondary compression could also continue to occur for a significant period of time afterwards, leaving the foundations having to adjust to the consolidated clay.

45. Mr. Crotty arrived at a number of conclusions; namely that cracking has occurred as a result of heavy vehicular traffic passing the house. He also found that the severity of the cracking was such that he was able to insert the blade of a large knife into the cracks in the stone front, back and gable walls of the Lace Factory and that he regarded this cracking as structurally significant. In his view there was significant structural cracking in the dormer extension behind the Lace Factory and in the single storey extension along with extensive signs of dampness throughout the building.

46. In conclusion, Mr. Crotty considers that the most likely reason the significant cracking has occurred is as a result of the large volume of heavy traffic in July/August 2008, as outlined by the first named plaintiff. He is concerned that dynamic consolidation of the soft clay materials has also occurred, leading to the continuation of the cracking as noted. He states that a proper route survey and subsequent traffic control ought to have been implemented by those responsible for the vehicular traffic passing the house.

47. It is his opinion that dynamic consolidation of the soft clay material explains the continuation of the cracking as noted. It now cannot be repaired and further tests are needed to ascertain whether manual underpinning is a viable option.

48. It is contended on the plaintiffs' behalf that technical evidence adduced by Mr. Crotty discloses a series of specific factors which, when combined, explain how the structure and, in particular the Lace Factory, suffered physical damage as a result of the vibration as set out hereunder:-

The structure was built on peat.

The structure has no formal foundation

The walls are rough masonry walls with loose fill rather than walls which would give greater rigidity.

The layout of the Lace Factory as an open hall deprived the structure of rigidity.

The construction of the Lace Factory by the use of arches to bear the load created points of weakness.

The proximity of the road to the house.

The road was built on peat.

The roadway was above the structure with the land falling away.

The road surface was unimproved and was rough and rutted.

The retaining wall failed and had no protection function

The speed of the heavy goods vehicles was not controlled.

The heavy goods vehicles were travelling in close convoys of five to seven vehicles.

Maximum weight was being carried on these vehicles, which were also capable of moving at a high speed.

It is contended these factors combined to render a vulnerable house subject to vibration whose effects were increased, and the interplay of these factors magnified the effect of the vibrations.

49. It is important to note that in order to confirm the contention of Mr. Crotty of dynamic compaction, tests in the way of penetration tests, sheer tests, standard penetration tests and soil sampling would be necessary. While Mr. Crotty performed a manual handling test on the soil on the 15th July, 2012, none of the other tests were ever carried out. It is the court's view that these factors seriously undermine Mr. Crotty's evidence. An attempt by Mr. Crotty was made to explain away this fact by claiming that the tests were no longer necessary due to the amount of remedial works needed now. The reality appears that the cost of the tests, between €6000-€8000, is what curtailed their performance. When contrasted with the initial amount claimed in damages by the plaintiffs, in excess of €1,000,000, it does appear a fairly reasonable amount to have expanded in order to form a basis for the contention outlined.

50. Mr. Crotty's expertise in this matter was also questioned and it became clear that he had never actually witnessed a case of traffic induced vibration damage to a building adjacent to a road and he had no experience of such in an engineering career of some 35 years. Indeed, this would corroborate the evidence offered by Dr. Hillar, where he stated that he had never come across a case of vibration damage to a roadside building caused by constant passing heavy vehicle traffic.

51. Mr. Crotty, as mentioned earlier, was the only engineer to carry out any testing at the property, in that trial holes were dug, and manual soil handling tests performed. However, in the court's view Mr. Crotty's evidence suffers from the same flaws as his colleague engineers' on the plaintiff behalf, relying on the plaintiffs misconceived factual evidence (as already adduced in evidence before this Court) and lacking the necessary tests to satisfy the court on the balance of probabilities as to the plaintiffs contention.

52. Mr. John Flaherty, a Consulting engineer with Arup's gave evidence on behalf of Shell and E&P Ireland and took the view that it was essential to engage a vibration expert to consult on these matters, leading to the retention of Dr. Hillar.

53. Mr. Flaherty had an alternative view to that of the plaintiffs' engineers, indicating that, in his view, the cracks that were evident were shrinkage cracks which were attributable, *inter alia*, to the nature of the opes, weathering and the type of materials used in the location of a property in an exposed area adjacent to the Atlantic Ocean. To support this Mr. Flaherty indicated the absence of any crack going from the outside to the inside of the property.

54. Mr. Flaherty offered an explanation to a variety of cracks and in particular, one crack which is described by Mr. Flaherty as a soft joint entirely consistent with the construction of the newer utility extension onto the old two storey building the crack also having been repaired prior to Mr. Mooney's survey in September, 2008.

55. Mr. Flaherty explains the chimney cracks as being in the nature of convection cracks caused by fires within the chimney prior to it being dismantled, and other cracks in this area were caused, in his opinion, by the installation of the roof at the top of the building. Mr. Flaherty completely discounted the crack referred to as "B", which is located immediately to the left above the entrance porch to the main two storey building, saying that there was no evidence that this crack went all the way through the wall, and no evidence that any dampness could penetrate the kitchen area as a result, thereof.

56. Mr. Flaherty discounted Mr. Crotty's contention, and that of Mr Ó Conaire, in relation to subsidence, stating that an inspection of the site and what is demonstrated is not consistent with subsidence. In stating this, Mr. Flaherty referred to a variety of literature relating to subsidence cracks and concluded that cracks indicated in the plaintiffs' property are not consistent with subsidence cracks.

57. Mr. Flaherty also rules out alternative causes of the cracking and his opinion is that the pattern of cracking points to a cause other than subsidence.

58. I prefer and accept Mr. Flaherty's evidence to that of the evidence adduced by the various engineers on the plaintiffs' behalf.

Conclusion

59. I am satisfied that the plaintiffs are mistaken in their evidence as regards the nature and extent of the vehicular traffic passing their house in June, July and August, 2008. I am satisfied that there was no unusual traffic movements prior to the 21st July, 2008. I am satisfied that the plaintiffs were mistaken in their recollection of events, and I am further satisfied that there was no movement of Shell/Roadbridge traffic heading to the landfill site prior to the 8th July, 2008.

60. I am further satisfied to accept the evidence as tendered on behalf of Mayo County Council, Shell/Roadbridge as regards traffic movement throughout the entire material period. I am satisfied that neither Mr. Ó'Conaire or Mr. Mooney possess the necessary expertise to come within the ambit of being expert witnesses in respect of vibration damage caused by vehicular traffic to properties adjoining a public highway and, in any event, they both were relying on the factual position as outlined to them by the plaintiffs, which information was incorrect.

61. Further, neither Mr. Ó'Conaire or Mr. Mooney carried out any relevant tests to support their contention and their combined evidence would not satisfy me on the balance of probabilities that the plaintiffs property was damaged by vibration caused by passing vehicular traffic on the adjacent public highway.

62. Similarly, Mr. Crotty does not satisfy me that he has the necessary expertise to be deemed an expert witness in relation to vibration damage caused to property adjoining a public highway by passing vehicular traffic and Mr. Crotty was also relying on particularised facts as outlined to him by the plaintiffs which are now shown to be incorrect. The extent of the tests as carried out by Mr. Crotty do not satisfy me on the balance of probabilities that damage was caused to the plaintiffs property by vibration caused by the defendants vehicles passing on the public highway adjacent thereto.

63. I prefer the evidence of Mr. John Flaherty and his view that the cracks that were evident were shrinkage cracks which were attributable, *inter alia*, to the nature of the weathering and the type of materials used in the location of the property in an area exposed to the Atlantic Ocean. I further prefer Mr. Flaherty's evidence that the cracks as outlined, in particular by Mr. Crotty, are not consistent with subsidence cracks.

64. I am of the view that Dr. Hillar does meet the necessary requirement to be deemed an expert witness in respect of vibration damage and it is quite clear from his evidence that he is sufficiently familiar with the contention for passing vehicular traffic allegedly giving rise to vibration damage to property adjoining a public highway. I prefer his evidence to that of the plaintiffs engineer and I am satisfied to come to a conclusion that the plaintiffs fail to discharge the onus of proof necessary to satisfy the court on the balance

of probabilities that the cracks and damage as seen in their property, the subject matter of these proceedings, was caused or contributed to by alleged vibration damage caused by the defendants passing vehicular traffic in the months of June, July and August, 2008.

65. Accordingly, I dismiss the plaintiffs claim.