Chapter 3
Design

3.1. What is the difference between a fitness for purpose responsibility and an obligation to exercise reasonable skill and care?

3.1.1. Clients, when appointing a designer, whether architect, engineer, contractor or subcontractor, expect the building or structure to operate when complete in the manner envisaged when the appointment was made. If the building or structure fails to meet the client's expectations, there are often questions asked of the designer and/or contractor as to whether the problem resulted from a failure on their part to meet their contractual obligations. These obligations will normally take the form of implied or express terms in the conditions of appointment or the terms of the contract under which the work was carried out. In the absence of an express term in the contract for providing a design service, there will be an implied term that the designer will use reasonable skill and care. The standard is not that of the hypothetical 'reasonable man' of ordinary prudence and intelligence, but a higher standard related to his professed expertise. This was laid down in *Bolam* v. *Friern Hospital Management Committee* (1957) by Mr Justice McNair, in stating:

> Where you get a situation which involves the use of some special skill or competence, then the test whether there has been negligence or not is not the test of the man on top of a Clapham omnibus, because he has not got this special skill. The test is the standard of the ordinary skilled man exercising and professing to have that special skill. A man need not possess the highest expert skill at the risk of being found negligent. It is well-established law that it is sufficient if he exercises the ordinary skill of an ordinary competent man exercising that particular art.

3.1.2. The case of *London Fire and Emergency Planning Authority* v. *Halcrow Gilbert Associates* (2007) dealt with damage and liability in respect of a fire which occurred at a training facility. It seems that artificial smoke was distributed through ducts to the various rooms in which training exercises took place. Mineral oil in the smoke coalesced on the outsides of the ducts and formed droplets, which then leaked out into the ducts and contaminated the insulation, which then caught fire. As this was a new design, the employer alleged that Halcrow should have carried out investigations as to the risks involved, which might have resulted in steps being taken which could have prevented the fire from

200 Contractual Problems and their Solutions, Third Edition. Roger Knowles.

starting. The defendant indicated that he expected a fine film of oil to develop and not the droplets which led to the fire. The judge, in finding in favour of the defendant, considered that the conclusions that a film of oil would form was reasonable and that he had not failed to exercise reasonable skill and care in failing to identifying the likely problem of droplets forming. In this case the defendant was found to have exercised reasonable skill and care, with no liability, but nonetheless failed to produce a product which was fit for its purpose.

3.1.3. A person who professes to have a greater expertise than in fact he possesses will be judged on the basis of his pretended skills. In *Wimpey Construction UK Ltd* v. *DV Poole* (1984), a case where, unusually, the plaintiffs were attempting to prove their own negligence, they attempted to convince the judge that a higher standard was appropriate to the case under consideration. They put forward two 'glosses', as the judge referred to them:

> First, that if the client deliberately obtains and pays for someone with specially high skill, the Bolam test is not sufficient.
>
> Second, that the professional person has a duty to exercise reasonable care in the light of his actual knowledge, not the lesser knowledge of the ordinary competent practitioner.

As regards the first gloss, the judge felt obliged to reject it in favour of the *Bolam* test. However, the judge accepted the second gloss, not as a qualification of the *Bolam* test, but as a direct application of the principle in *Donoghue* v. *Stevenson* (1932). This requires reasonable care to be taken to avoid acts or omissions which one can reasonably foresee would be likely to injure a neighbour.

3.1.4. Another important aspect of reasonable skill and care is what is generally referred to as the 'state of the art' defence. Briefly, what this means is that a designer is only expected to design in conformity with the accepted standards of the time. These standards will generally consist of Codes of Practice, British Standards or other authoritative published information.

3.1.5. Unlike a professional designer, such as an architect, where a contractor or subcontractor undertakes design work or production of working drawings, there is, in the absence of an express term in the contract, an obligation to produce a product fit for its purpose. This is in marked contrast to a professional designer's implied obligation of reasonable skill and care. The duty to produce a building fit for its purpose is an absolute duty, independent of negligence. It is a duty which is greater than that imposed upon an architect employed solely to design, who would only be liable (in the absence of an express provision) if he were negligent. Express provisions to the contrary will obviously negate any implied terms. The contractor's position is best illustrated by the following extracts from leading cases:

Independent Broadcasting Authority v. *EMI Electronics Limited* (1980):

> In the absence of a clear, contractual indication to the contrary, I see no reason why [a contractor] who in the course of his business contracts to design, supply and erect a television aerial mast is not under an obligation to ensure that it is reasonably fit for the purpose for which he

> knows it is intended to be used. The Court of Appeal held that this was the contractual obligation in this case and I agree with them. The critical question of fact is whether he for whom the mast was designed relied upon the skill of the supplier to design and supply a mast fit for the known purpose for which it was required . . . In the absence of any terms (express or to be implied) negativing the obligation, one who contracts to design an article for any purpose made known to him undertakes that the design is reasonably fit for the purpose.

Greaves Contractors Limited v. *Baynham Meikle & Partners* (1975):

> Now as between the building owners and the contractors, it is plain that the owners made known to the contractors the purpose for which the building was required, so as to show that they relied on the contractors' skill and judgment. It was, therefore, the duty of the contractors to see that the finished work was reasonably fit for the purpose for which they knew it was required.

In the circumstances of this case, the designers were also held to have a liability to ensure that their design was fit for its purpose.

Young and Marten v. *McManus Childs* (1969):

> I think that the true view is that a person contracting to do work and supply materials warrants that the materials that he uses will be of good quality and reasonably fit for the purpose for which he is using them unless the circumstances of the contract are such as to exclude any such warranty.

3.1.6. The House of Lords' decision in *Slater* v. *Finning* (1996) held that no liability lies where a party is not aware of the particular purpose for which the goods are intended, or where the proposed use deviates from the normal use. The principle, as expressed by Lord Keith, was:

> As a matter of principle . . . it may be said that where a buyer purchases goods from a seller who deals in goods of that description there is no breach of the implied condition of fitness where the failure of the goods to meet the intended purpose arises from an abnormal feature or idiosyncrasy not made known to the seller by the buyer or in the circumstances of the use of the goods by the buyer. That is the case whether or not the buyer is himself aware of the abnormal feature or idiosyncrasy.

Lord Steyn provided a useful example of the application of this decision in the construction industry in saying:

> If a contractor in England buys pipes from a dealer for use in a pipe-laying project the seller would normally assume that the pipes need merely to be suitable to withstand conditions in our moderate climate. If the contractor wishes to use the pipes in arctic conditions for a Siberian project, an implied condition that the pipes would be fit to withstand such extreme weather conditions could only be imputed to the seller if the buyer specifically made that purpose known to the seller.

In the case of *J Murphy and Sons Ltd* v. *Johnston Precast Ltd* (2008), Johnston was engaged by Murphy to supply a length of glass-reinforced plastic pipe in a tunnel and surrounded it with foam concrete. Due to alkaline attack, the pipe in the void was unable to withstand the pressure exerted by the concrete and the pipe burst. It was held that, whilst Johnston had an obligation to supply a pipe which was fit for its purpose, they were not made aware of the fact that it was to be surrounded by foam concrete.

3.1.7. In the case of *PSC Freyssinet Ltd* v. *Byrne Brothers (Formwork) Ltd* (1996), the court had to decide liability where a design failure occurred due to a lack of provision for early thermal movement. The defendant, Byrne Brothers, was a subcontractor for the design and construction of the car park superstructures at the Lakeside Shopping Complex in Thurrock, Essex. PSC was employed by Byrne Brothers to design and install post-tensioned reinforcement and grouting. Whilst PSC owed a fitness for purpose obligation, it was not responsible for the design of the whole beam, as to do so would require a consideration of its relation to the entire structure and not merely the subframe. The court considered it absurd to hold PSC to a 'fitness for purpose' term when their work might be affected by information supplied by a third party, namely the architect.

3.1.8. JCT Design and Build Contract places the following design responsibility upon the contractor:

> the Contractor shall have in respect of any inadequacy of such design the like liability to the Employer, whether under statute or otherwise, as would an architect or as the case may be other appropriate professional designer . . .

GC/Works/1 1998 imposes a different responsibility. Condition 10, Alternative B states:

> The Contractor warrants to the Employer that any Works . . . will be fit for their purposes, as made known to the Contractor by the Contract.

ICE Design and Construct, clause 8(2), requires the contractor in carrying out his design responsibility to 'exercise all reasonable skill and care'. It can be seen that some of the standard forms reduce the contractor's 'fitness for purpose' obligation, which the law would normally imply, to the less onerous task of exercising reasonable skill and care. The main reason for this is the difficulty contractors have in obtaining insurance cover for a fitness for purpose obligation.

SUMMARY

In the absence of an express term in the conditions of contract, a designer, whether architect, engineer or other designer, will have an implied obligation to carry out his design obligation employing reasonable skill and care. The test is whether the level of skill provided is the standard of the ordinary skilled person exercising and professing to have that skill.

Where a contractor or subcontractor undertakes a design responsibility in conjunction with an obligation to construct the works there is, in the absence of an express term

in the contract, an implied obligation to produce a design which is reasonably fit for its purpose. This is an absolute duty and any failure of the design solution will place a responsibility upon the design and construct contractor or subcontractor, whether or not the problem results from negligence. For this obligation to arise, the contractor or subcontractor, at the time the contract was entered into, must be aware of the purpose for which the facility is to be employed.

Some of the standard forms reduce the contractor's 'fitness for purpose' obligations which the law would normally imply to the less onerous 'reasonable skill and care'.

3.2. Where a contractor/subcontractor's drawings are 'approved', 'checked', 'inspected', etc. by the architect/engineer and subsequently an error is discovered, who bears the cost – the contractor, subcontractor or employer? If the employer bears the cost, can he recover the sum involved from the architect/engineer?

3.2.1. In general terms, when an employer appoints an architect or engineer to design a building or work of a civil engineering nature, he is entitled to expect the architect or engineer to be responsible for all design work. This basic principle was established in the case of *Moresk Cleaners Ltd* v. *Thomas Henwood Hicks* (1966). The plaintiffs were launderers and dry cleaners who appointed the defendant architect to undertake the design work of an extension to their laundry. Instead of designing all the work himself, the architect arranged for the contractor to design the structure. The employer brought an action for defective design against the architect, who argued that his terms of engagement entitled him to delegate the design of the structure to the contractor. It was held that an architect has no power whatever to delegate his duty to anybody else. Sir Walter Carter QC had this to say:

> [Counsel for the architect] in a very powerful argument, asks me to say alternatively that the architect had implied authority to act as agent for the building owner to employ the contractor to design the structure and to find that he did just this. I am quite unable to accept that submission. In my opinion he had no implied authority to employ the contractor to design the building. If he wished to take that course, it was essential that he should obtain the permission of the building owner before that was done.

3.2.2. Nevertheless, the architect or engineer in his terms of engagement may include a term which permits him to use a specialist contractor, subcontractor or supplier to design any part of the works, leaving the architect or engineer with no responsibility if the design work undertaken by others contains a fault, but the employer has to agree to this. Where a part of the design work is carried out by a subcontractor or supplier in accordance with an express term in the architect's or engineer's conditions of appointment, it is in the employer's interest to obtain some form of design warranty from the subcontractor or supplier. The employer would then be able to seek to recover any loss or damage resulting from design faults by the subcontractor or supplier on the basis of the warranty.

3.2.3. If, however, an architect or engineer (having excluded his responsibility for a subcontractor's design in the terms of his appointment) approves, checks or inspects a subcontractor's drawing, does he then take on any responsibility for a failure of the design? It is essential for the architect or engineer to make it clear to both employer and subcontractor exactly what he is doing with the drawings. If he is checking the design carried out by the subcontractor or supplier, he may find that, even though the terms of his appointment exclude liability, he may have adopted a post-contract amendment to the conditions and with it responsibility. The employer will be left to bring an action against either the architect/engineer or the subcontractor who carried out the design. An unfortunate aspect of English law is that both may be held to be jointly and severally liable. In other words, the employer can extract the full amount of his loss or damage from either party. This can be useful to the employer if a subcontractor carried out the design and subsequently became insolvent, leaving a well-insured architect who had checked the design to stand the full amount of the loss. Alternatively, the employer may decide to sue both, leaving the court to allocate his loss or damage between the joint defendants, after he has been paid in full by one or other of them.

3.2.4. If the architect/engineer is not checking the design, then he must make it very clear what he is doing. Ideally, it should be set out in the architect's/engineer's terms of appointment precisely what his duties are with regard to design work undertaken by a contractor, subcontractor or supplier. Should the employer commence an action against the architect/engineer alone, then, under the Civil Liability (Contribution) Act 1978, the architect/engineer may seek a contribution from the contractor, subcontractor or supplier whose design was faulty. In the event of the employer deciding to sue the contractor, subcontractor or supplier alone they, likewise, may seek a contribution from the architect/engineer.

3.2.5. The fact that an engineer receives drawings does not in itself imply that he has any liability for errors in design. In *J Sainsbury plc* v. *Broadway Malyan* (1998) a claim for defective design was settled out of court. The problem related to the design of a wall between a store area and retail area. Due to the low level of fire protection, fire spread and caused substantial damage. The architect attempted to off-load some of the liability upon an engineer to whom the drawings had been sent for comment. It was held that, if the architect wanted to get the structural engineer's advice on fire protection, he needed to say so. Simply to transmit the drawings for comment, without specifying any area in which comment was requested, was not sufficient to imply any obligation.

3.2.6. A different slant was placed upon acceptance of drawings by the engineer in the case of *Shanks & McEwan (Contractors) Ltd* v. *Strathclyde Regional Council* (1994), which arose out of the construction of a tunnel for a sewer. A method of construction was employed using compressed air to minimise water seepage. The tunnel and shaft segments, in compliance with the specification, were designed by a supplier to the main contractor. The main contractor was to be responsible for the adequacy of the design insofar as it was relevant to his operations, but it was also a requirement of the specification that design calculations were to be submitted to the engineer. In the course of construction, fine cracks appeared in the prefabricated tunnel segments because of a design fault. The engineer was prepared to accept the work, subject to the segments being made reasonably watertight and confirmed the same in a letter to the contractor dated 21 September

1990. Clause 8(2) of the ICE 5th Edition, which governed the contract, states that the contractor shall not be responsible for the design of the permanent works. There seemed to be a conflict between clause 8(2) and the specification, which placed responsibility for the design of the tunnel segments onto the contractor. The contractor levied a claim for the cost of the repair work. It was the view of the Court of Session in Scotland that, following acceptance by the engineer of the design of the segments, the contractor was entitled to expect that the approved design would not crack. The letter from the engineer dated 21 September 1990, which accepted repair work to the segments, was held to be a variation and therefore the contractor was entitled to be paid for that work.

3.2.7. The employer's ability to recover from the engineer any costs incurred because of design error on the part of the contractor or subcontractor will depend upon a number of factors. If the design faults lie with the contractor or subcontractor, it is to those who caused the error that the employer would normally address his claim. If the employer is unable to recover from the contractor or subcontractor, for example because of insolvency, he may wish to turn his attentions to the engineer. The ability to recover will depend upon the terms of the engineer's appointment. If the matter is referred to court, all involved in the design process will normally be joined into the action. In *London Underground* v. *Kenchington Ford* (1998), the design of a diaphragm wall at the Jubilee Line station of Canning Town became the subject of a dispute. The diaphragm wall was designed by Cementation Bachy (the contractors). London Underground argued that Kenchington Ford (the engineer) had failed to realise that there had been a mistake in computation made by Cementation Bachy and consequently the diaphragm wall was designed too deep and hence over-expensive. The error had resulted from Cementation Bachy misinterpreting the load shown on the drawing. The contract stated that Cementation Bachy would be responsible for design errors, whether approved by the engineer or not. Kenchington Ford was under a duty to London Underground to provide services, which included the correction of any errors, ambiguities or omissions. The judge concluded that Kenchington Ford should have checked and discovered the error, and as they had not, this constituted a breach of duty. In *George Fischer (GB) Ltd* v. *Multi Design Consultants Roofdec Ltd*, *Severfield Reece and Davis Langdon and Everest* (1998), a complex multiparty action, the employer's representative was held to be partly liable in respect of the design error. The employer's representative's conditions of appointment obliged him to approve all working drawings. Following judgment in favour of the employer, the parties agreed on the sum payable as damages. Multi Design Consultants, who carried out the design function, were liable in the sum of £940,000, with the liability of the employer's representative, Davis Langdon and Everest, being £807,388.

SUMMARY

The approval of a contractor's or subcontractor's drawings by the architect or engineer, will not usually relieve the contractor or subcontractor from liability. Employers who incur costs due to this type of error will normally commence an action against both the contractor/subcontractor who prepared the drawings and the architect/engineer who

gave his approval. The court will decide on the apportionment of blame. Where the employer incurs cost due to errors in the contractor/subcontractor's design, these costs may be recovered from the engineer/architect if a duty to check the drawing was expressly or impliedly provided for in the conditions of appointment and the errors result from a failure to carry out the checking properly.

3.3. Who is responsible for co-ordinating design? Can a main contractor be legitimately given this responsibility, even though he has no design responsibility?

3.3.1. When an employer appoints an architect/engineer to design a building or work of a civil engineering nature, he is entitled to expect the architect/engineer to be responsible for all design work. This basic principle was established in *Moresk Cleaners Ltd* v. *Thomas Henwood Hicks* (1966).

3.3.2. This being the case, the architect/engineer will also be responsible for co-ordinating design, unless there is an express term in the contract to the contrary.

3.3.3. Specifications for mechanical and electrical work and other specialist disciplines often refer to the subcontractor being responsible for design co-ordination. This will not absolve the architect from his design responsibilities, expressed or implied, in the conditions of engagement. If the specification which refers to a subcontractor being responsible for design co-ordination becomes a main contract document, then the employer may bring an action against the main contractor for breach in respect of any loss or damage resulting from poor design co-ordination. Any liability on the part of the main contractor would be recoverable from the subcontractor under the terms of the subcontract. Alternatively, design co-ordination may be specifically referred to in a design warranty entered into by the subcontractor, in which case the employer may commence an action for breach of warranty against the subcontractor for faulty co-ordination.

3.3.4. Where the contractor is required to design a part of the work only, it will be the architect's responsibility to ensure that the contractor's design is properly co-ordinated with his own design work.

3.3.5. The main contractor's responsibility for design co-ordination will be dependent upon the terms of the contract. Design by contractors, employing either a full design and construct procedure or a partial design and construct, is on the increase. Even without a design responsibility, the terms of the main contract may impose a responsibility upon the main contractor to undertake design co-ordination. However, it is unlikely that, in the absence of express terms in a main contract or subcontract, an obligation to co-ordinate design will rest on the main contractor or subcontractor.

3.3.6. If the contractor is required to co-ordinate design work, an express clause must be included in the contract which is fully descriptive of the co-ordinating activities required of the contractor. A brief term which states that the contractor is responsible for co-ordinating the work of all subcontractors, including design, would not be adequate. A much more descriptive clause is necessary. This clause should indicate which trades are involved and expressly state that all costs and losses resulting from a failure properly to

co-ordinate the subcontractors' design and working drawings will be borne by the main contractor.

3.3.7. Where there is no reference to a design obligation in the main contract, it is unlikely that the main contractor will become liable for any defective design by a subcontractor: *Norta* v. *John Sisk* (1971).

3.3.8. The problem often starts with the appointment of the architect or consulting engineer. It is essential that his conditions of appointment spell out clearly the duties which he is required to undertake. Clarity in the terms of the main contract and subcontract are also essential.

3.3.9. Building Information Modelling is now being used on some of the larger projects. As this system allows a three-dimensional perspective of the project, design coordination is much easier and the likelihood of clashes of services becomes less likely.

SUMMARY

The architect/engineer will normally be responsible for design co-ordination, except where the contractor is appointed on a design and build basis. It is possible for an architect to disclaim the responsibility for design co-ordination in his conditions of engagement with the employer and place the burden upon the contractor's shoulders. For a main contractor to take on a responsibility for design co-ordination will require a fully descriptive clause in the main contract conditions of contract.

3.4. Can a contractor be held responsible for a design error where the employer appoints an architect and no provision exists in the contract for the contractor to undertake any design responsibility?

3.4.1. It is commonplace for a contractor to have placed upon him by the terms of contract, a full design responsibility. Some contracts provide for parts only of the work to be designed by the contractor. If under the contract the employer appoints an architect, whose duty it is to prepare all the drawings, with no reference being made to a contractor's design responsibility, can a situation ever arise where the contractor finds himself liable for a design fault?

3.4.2. In the case of *Edward Lindenberg* v. *Joe Canning, Jerome Contracting Ltd* (1992) the plaintiff engaged the defendant builder for some conversion work on a block of flats. During the work, load-bearing walls in the cellar were demolished, which caused damage in the flat above. The plaintiff sued the defendants for breach of contract and/or negligence, seeking repayment of the sums he was forced to pay the building owners under an indemnity. The plaintiff alleged that Canning was in breach of an implied term that he would proceed in a good and workmanlike manner and that he had negligently demolished the load-bearing walls without providing temporary or permanent support. It was held:

(1) As there was no express agreement between the parties, Canning was entitled to be paid on a *quantum meruit* basis for labour and materials.
(2) There was an implied term that the defendant would undertake the work in a good and workmanlike manner and exercise the care expected of a competent builder. He had been supplied with plans, prepared by the plaintiff's surveyor, which supposedly indicated which walls were non-load-bearing. However, as a builder, he should have known that since they were nine-inch walls, they were in fact load-bearing. As he took 'much less care than was to be expected of an ordinary competent builder', he was in breach of contract but not liable in negligence.
(3) The plaintiff was entitled to recover £7,484 (representing the amount he had to reimburse the building owner, plus professional fees), less a sum for contributory negligence.
(4) The plaintiff had been guilty of contributory negligence through his agents, in that Canning had been given plans which wrongly showed which walls were non-load-bearing; oral instruction had been given to demolish walls and no instructions had been given regarding the provision of supports. The liability was attributed at 75% to the plaintiff and 25% to the defendant. The plaintiff's damages were reduced accordingly to £1,871.
(5) Canning was entitled to a *quantum meruit* payment, assessed at £4,893. As this was less than the £7,000 which the plaintiff had advanced to him, Canning was liable to repay the difference.

This case illustrates that the contractor, where the design is faulty, can take on a design responsibility if a reasonably competent contractor would have identified the error.

3.4.3. It is possible for a contractor to have imposed upon him variations to the contract where the work in the variation imposes a design responsibility.

SUMMARY

The fact that the employer employs an architect and the main contract makes no reference to the contractor's design responsibility does not mean that the contractor cannot become responsible for design errors. In the *Joe Canning* case the drawings incorrectly showed which walls were load-bearing. The contractor was, nevertheless, held to be liable in breach of contract for taking much less care than an ordinary competent builder in demolishing the walls which turned out to be load-bearing. It is also possible, although unusual, for a contractor to be issued with a variation which includes a design responsibility.

3.5 Can a main contractor be responsible if a nominated/named subcontractor's design is defective?

3.5.1. Whether a main contractor is responsible for a nominated or named subcontractor's design error is usually decided following a careful study of the contract documents. It

is common practice for the architect or engineer to arrange for specialist work to be designed by a subcontractor, who is then either nominated or named in the contract documents. Often, the main contractor has no involvement whatsoever in the design of the specialist work.

3.5.2. The matter is catered for in the ICE 6th and 7th Editions at clause 58(3), which states:

> If in connection with any Provisional Sum or Prime Cost Item the services to be provided include any matter of design or specification of any part of the Permanent Works or of any equipment or plant to be incorporated therein such requirement shall be expressly stated in the Contract and shall be included in any Nominated Sub-contract. The obligation of the Contractor in respect thereof shall be only that which has been expressly stated in accordance with this sub-clause.

The ICE contracts therefore make it crystal clear where the contractor's responsibility lies with regard to the design of a nominated subcontractor's work.

3.5.3. JCT 98, in clause 35.21, in like manner to the ICE 6th and 7th Editions, makes it clear that the contractor is not responsible for design work undertaken by a nominated subcontractor. There is no provision for the appointment of nominated subcontractors in JCT 2011.

3.5.4. In the case of *Norta* v. *John Sisk* (1977), the Irish Supreme Court had to decide the contractor's liability for a nominated subcontractor's design error, where the conditions of the main contract made no reference to design responsibility. The claimant entered into a contract to construct a factory for making wallpaper. Prior to the receipt of tenders from main contractors, the claimant approved a quotation from Hoesch Export for the design, supply and erection of the superstructure of the factory, including roof lights. Hoesch Export became nominated subcontractors to John Sisk, the appointed main contractor. Following practical completion, the roof began to leak, because of faulty design of the roof lights. The claimant sought to recover his losses from the main contractor, John Sisk. No reference was made in the main contract to John Sisk having any design responsibility. It was argued on behalf of the claimant that a design obligation was implied into the main contract. The Irish Supreme Court held that no such term could be implied into the main contract and therefore John Sisk had no liability.

3.5.5. JCT 98 includes for performance specified work. Clause 42 provides for performance specified work to be included in the contract by means of the employer indicating the performance he requires from such work. Before carrying out the work, the contractor must produce a contractor's statement in sufficient form and detail adequately to explain the contractor's proposals. The contractor will be responsible for any fault in the contractor's statement, which may include design work by subcontractors if the fault results from a failure to exercise reasonable skill and care. There is no provision in JCT 2011 for performance specified work.

3.5.6. The main contractor will be responsible for all design work, including that of subcontractors, where design and construct conditions apply, e.g. a JCT Design and Build Contract.

3.5.7. Many non-standard forms of contract or amendments to standard forms make it clear that the main contractor is responsible to the employer for all the nominated subcontractors' work, including design.

SUMMARY

The main contractor will be responsible for design faults in a named or nominated subcontractor's work if there is a clear statement to that effect in the main contract. In the absence of an express obligation, an employer would have to show that such an obligation was implied. This may prove difficult, if the subcontractor's design work was developed through a liaison between the subcontractor and architect/engineer direct, particularly if this took place without any involvement by the contractor. To protect himself against loss due to subcontractors' design faults, it is advisable for the employer to enter into a design warranty direct with the subcontractor. Most of the commonly used standard forms of contract make it clear that the main contractor is not responsible for a nominated subcontractor or nominated supplier's defective design. Where the contract is placed on a design and construct basis, the contractor will be responsible for all design work undertaken by named or nominated subcontractors, unless the main contract states otherwise.

3.6. Must a contractor notify an architect/engineer of defects in his design?

3.6.1. Human errors occur on a regular basis, including design errors by architects and engineers. Contractors may from time to time suspect that a design error has occurred. If this be the case, does the contractor have an obligation to draw attention to the design error?

3.6.2. The case of *Equitable Debenture Assets Corporation Ltd* v. *William Moss and Others* (1984) involved a building where the curtain wall leaked, due to defective design undertaken by a subcontractor. Unfortunately, the subcontractor went into liquidation and the employer brought an action against the architect and main contractor. In finding against the main contractor, the court held that a term should be implied into the contract that the contractor is required to report design defects known to him.

3.6.3. The case of *Victoria University of Manchester* v. *Hugh Wilson and Others* (1984) dealt with a problem of ceramic tiles falling off the exterior face of a building at Manchester University. The cause was a combination of poor design and poor workmanship. With regard to design defects, it was held that the contractor had a duty under an implied term of JCT 63, on which the contract was based, to warn of design defects which they believed to exist. However, there was no obligation on the part of the main contractor to undertake a close scrutiny of the architect's drawings. Judge John Newey said:

> The contractor's duty to warn the architect of defects which they believe existed in the architect's design, did not in my view require them to make a critical survey of the drawings, bills and specifications looking meticulously for mistakes.

3.6.4. A more recent decision is *University of Glasgow* v. *Whitfield and Laing* (1988), which called into question the decisions in *Equitable Debenture Assets Corporation* and *Victoria University*. In this case, it was alleged that the contractor owed an implied duty to the

architect to warn of design faults. However Judge Bowsher had this to say when holding that the contractor had no duty to the architect to warn of defects:

> Mr Gaitskell on behalf of the defendant relies on the decisions of Judge Newey QC in *Equitable Debenture Assets Corporation* v. *William Moss* (1984) and *Victoria University of Manchester* v. *Wilson* (1984). On analysis it is clear that both cases were concerned with a duty of a contractor to warn the employer, not a duty owed by the contractor to warn the architect. References to a duty to give a warning to the architect were in both cases references to a duty to warn the architect as agent of the employer. It is clear from page 163 of the report of the *Victoria University of Manchester* case that the learned judge considered that both decisions were founded on implied contract between the contractor and the building owner. In each case, the learned judge cited *Duncan* v. *Blundell* (1820) and *Brunswick Construction Limited* v. *Nowlan* (1974). It is plain from the citation from the *Brunswick Construction* case that the learned judge had in mind the situation where the contractor knew that the owner placed reliance on him in the matter of design. It seems to me that the decisions in *EDAC* v. *Moss and Victoria University of Manchester* can stand with more recent decisions if they are read as cases where there was a special relationship between the parties, but not otherwise, and bearing in mind the difficulties in analysing the meaning of the words 'special relationship' and 'reliance' demonstrated by Robert Goff LJ in *Muirhead* v. *Industrial Tank Limited* (1986). On the facts of the present case it is not necessary to resolve those difficulties.

3.6.5. In *Edward Lindenberg* v. *Joe Canning, Jerome Contracting Ltd* (1992) (see 3.4.2), the contractor was held liable to make a contribution to the cost of remedial works resulting from the demolition of load-bearing walls. The walls were shown on the architect's drawings as non-load-bearing.

3.6.6. The opinion expressed by Judge Bowsher, to the effect that the employer and contractor must have a special relationship before an obligation to warn of design defects arises, does not seem to have been followed in subsequent cases. In *CGA Brown* v. *Carr* (2006), the judge, in respect of a defect in the roof design, was of the view that the builder should have discovered the problem, which was inherent in the design, before commencing construction. A reasonably competent builder, he thought, should have reported the defect to the client. In *J Murphy and Sons Ltd* v. *Johnston Precast Ltd* (2008), the judge expressed his opinion that a duty to warn arose when there was knowledge of a problem, or where there should reasonably have been knowledge.

3.6.7. The subject of a contractor's duty to warn occurred in *Plant Construction plc* v. *Clive Adams Associates and Another* (1999), heard before the Court of Appeal. Ford appointed a company trading under the name of Plant to install two engine mounts in a research and development centre at the Ford Research Engineering Centre. The substructure and underpinning of a roof was subcontracted to JMH. A variation was issued involving the design of the temporary works by a representative of Ford. The design was defective and collapse occurred. JMH was not responsible for the design, but it was held that they had an implied obligation to exercise reasonable skill and care. An experienced contractor such as JMH would have an obligation to warn of errors in design which were obviously dangerous and defective. The decision left open the situation where the design is obviously defective, but not dangerous.

3.6.8. Some forms of contract, for example JCT Design and Build, require the contractor to notify the employer of any discrepancies arising from the Employer's Requirements, Contractor's Proposals and instructions issued by the employer, as required by the conditions of contract.

SUMMARY

It was held in the *University of Glasgow* v. *Whitfield and Laing* case that in the absence of express provisions, the contractor may have an implied duty to the employer to warn of design faults, but only where a special relationship exists between them. There would otherwise appear to be no obligation in the absence of an express term in the contract.

This decision is difficult to comprehend. If correct, a contractor knowing of a design error could carry out construction work without obligation. It is hard to anticipate any subsequent cases following this decision. The decision in the *Equitable Debenture* case is to be preferred, where it was held that an implied term exists in construction contracts that contractors should report design defects known to them. In the case of *Plant Construction plc* v. *Clive Adams* (1999) it was held that a contractor would have an obligation to warn of errors in design which were obviously dangerous and defective.

It is suggested that contractors do have an implied obligation to notify the architect/engineer of suspected errors in the design. This does not, however, extend to the contractor being obliged to make a careful study of the drawings, in an attempt to identify errors.

3.7. Where an architect/engineer includes a new product in his design following advice from a manufacturer and the product proves to be unsuitable, is the architect/engineer liable to the employer for his losses?

3.7.1. Engineers and architects often have difficulty in providing appropriate design solutions to suit planning constraints, environmental considerations and the client's financial position. Manufacturers often make claims that a new product will meet the architect's/engineer's requirements. In the absence of a track record the architect/engineer is seen to be taking a risk in specifying the new product. If, having made checks concerning the manufacturing process and having sought whatever advice is available, the architect/engineer specifies the product, what liability does the architect have to the client if the product proves unsatisfactory?

3.7.2. The case of *Victoria University of Manchester* v. *Hugh Wilson and Others* (1984) arose out of a major development for the plaintiffs, erected in two phases between 1968 and 1976. The first defendants were the architects for the development, the second defendants the main contractors and the third defendants nominated subcontractors. The architects' design called for a building of reinforced concrete (which was not waterproof) to be clad partly in red Accrington bricks and partly in ceramic tiles. In due

course, many of the tiles fell off and the University adopted a remedial plan which involved the erection of brick cladding with a cavity between bricks and tiles and with the brick walls attached to the structure by steel ties. It was held that the architect was liable as his design was defective. With regard to the use of untried materials, Judge John Newey had this to say:

> For architects to use untried, or relatively untried materials or techniques cannot in itself be wrong, as otherwise the construction industry can never make any progress. I think, however, that architects who are venturing into the untried or little tried would be wise to warn their clients specifically of what they are doing and to obtain their express approval.

3.7.3. In *Richard Roberts Holdings Ltd* v. *Douglas Smith Stimson Partnership* (1988) a tank lining failed. The employer brought an action against the architect for negligence. The architect's defence was that he had no legal liability, as the employer knew that he had no knowledge of linings. It was held, again by Judge John Newey, that:

> The architects were employed for the design of the whole scheme of which the linings were an integral part. The architects did not know about linings, but part of their expertise as architect was to be able to collect information about materials of which they lacked knowledge and/or experience and to form a view about them. If the architects felt that they could not form a reliable judgment about a lining for a tank they should have informed the employer of that fact and advised them to take other advice . . .

SUMMARY

Where an engineer/architect includes a new product in his design, the employer should be informed at the outset. Failure to advise the employer could leave the engineer/architect exposed to a liability for negligence, should the new product fail.

3.8. Where an architect/engineer is required by the conditions of the contract to approve, or accepts a contractor or subcontractor's drawings, how long can he take before an entitlement to an extension of time arises?

3.8.1. It is quite common for contractors or subcontractors to be required to produce drawings in respect of their installation. Well-drafted specifications will normally provide for an approval or acceptance system. The system will set out the roles to be played by architect/engineer and contractor or subcontractor up to the stage of approval or acceptance of the drawings. Usually, a timescale will be included which will indicate the maximum time within which the drawings must be approved or accepted or queries raised. Time will normally be allowed for answering queries with final approval or acceptance, again within a timescale. If the architect or engineer fails to approve, accept or query a contractor or subcontractor's drawing within the timescale, and as a result the completion

date for the project is delayed, there is usually an entitlement to an extension of time. If there is no provision for extending time, where delays are caused by late approval or acceptance, then time becomes at large and the contractor or subcontractor's obligation is to complete within a reasonable time.

3.8.2. GC/Works/1 Design and Build requires the contractor to ensure that the programme allows reasonable periods of time for the provision of information from the employer.

3.8.3. Contractors and subcontractors will often indicate on the face of the drawing a period of time within which approval is sought.

3.8.4. Where there is no timescale in the procedures within which the architect/engineer is required to approve or accept or query a contractor's or subcontractor's drawing, or perhaps there is no formal procedure provided for approvals in the specification, the court will normally hold that such a term will be implied to give the contract business efficacy. A clause will usually be implied to the effect that approval by the architect/engineer must be given or any query raised within a reasonable time. What is a reasonable time will depend upon the circumstances of each case and would include such matters as any time allowed on the contractor's or subcontractor's programme; the rate of progress of the work; and the date fixed for completion.

SUMMARY

Ideally, the contract will indicate what period of time is to be allowed for drawing approval; alternatively, the contractor's programme should address the point. If there is no provision in the contract, then it will be implied that a reasonable period will be allowed.

3.9. Where is the line to be drawn between an architect/engineer's duty to design the works or a system and a contractor or subcontractor's obligation to produce working shop or installation drawings?

3.9.1. Where a contract such as JCT 2011, ICE 6th or 7th Editions, MF/1 or GC/Works is employed, the duty to design the works rests with the architect/engineer. However, provision is made in these contracts for some or all of the design work to be prepared by the contractor. Many bespoke engineering contracts require the contractor to be responsible for the detailed design of the plant and of the works in accordance with the specification. Specifications are often written to the effect that specialist engineering subcontractors will be obliged to produce shop or working drawings. There is no hard and fast rule as to where the architect's/engineer's obligations cease and those of the contractor or subcontractor begins. It will be a matter for a decision to be made in each and every case.

3.9.2. In *H. Fairweather & Co* v. *London Borough of Wandsworth* (1987), a subcontract was let using the now out-of-date NFBTE/FASS nominated subcontract, often referred to as

the Green Form. The description of the works set out in the appendix to that form was to 'carry out the installation and testing of the underground heat distribution system, as described in [the specification]'. The specification had two provisions. Clause 1.15 made it the subcontractor's responsibility to provide the installation drawings and they were also 'responsible for providing all installation drawings in good time to meet the agreed programme for the works'. Section 3(b) of the technical specification also required detailed drawings to be prepared and supplied by the subcontractor. Before entering into the nominated subcontract, Fairweathers had written to the architect in an endeavour to disclaim 'any responsibility for the design work that may be undertaken by your nominated subcontractor'. They also asked for 'a suitable indemnity against defects in design work carried out by the nominated subcontractor'. The architect's reply drew attention to the provisions of clause 1.15 and pointed out that these did not 'require [them] to assume responsibility for the design of the system'. Fairweathers did not take the matter further and entered into the subcontract. The arbitrator found that the installation drawings were not design drawings. The judge agreed with him, although he had not seen the drawings. It does not appear that there was any dispute about responsibility for the content of the installation drawings and it would seem from this case that one cannot deduce that 'installation drawings' in general do not embody any 'design'. The architect had made it clear that the installation drawings were to be provided so as to meet the requirements of the programme and that the subcontractors were not responsible for the design of the system. However, in the course of preparing a detailed design for the installation of a system, decisions are taken of a design nature by the person responsible for the preparation of the drawings. In the absence of a clear contrary indication, the responsible contractor, subcontractor or supplier will be held liable.

3.9.3. It is not always obvious where the line is to be drawn between design or conceptual design and shop or working drawings. What is the purpose of the shop or working drawings? Some may argue that the intention is that the contractor's or subcontractor's duty is to fill in the gaps left in the design or conceptual design drawings. Others may argue that the purpose of shop or working drawings is to convert design information into a format to enable the materials to be manufactured and fixed.

3.9.4. It is essential, if a named or nominated subcontractor is to produce shop or working drawings, for the contract to stipulate in clear terms what is meant by these terms.

SUMMARY

It would seem that it is almost impossible to produce a dividing line to differentiate between design drawings and working, shop, or installation drawings. Each case would have to be judged on its merits. A reasonable interpretation is that the purpose of shop or working drawings is to convert design information into a format to enable the materials to be manufactured and fixed. It is advisable for the contract to stipulate in clear terms what is meant by these terms.

3.10. Where an item of work has been properly provided for in the Employer's Requirements but is missing from the Contractor's Proposals, can the contractor claim extra payment for doing the work, on the grounds that it was never included in the contract price?

3.10.1. If we were living in a perfect world, then all contract documents would be fault-free. Unfortunately, human beings are often known to err and, as a result, discrepancies are apt to appear between the employer's requirements and contractor's proposals.

3.10.2 The recitals to the JCT Design and Build Contract state:

> the Employer wishes to have the design and construction of the following work carried out . . . and the Employer has supplied the Contractor with documents showing and describing or otherwise stating his requirements (Employer's Requirements).

In response to the Employer's Requirements the contractor has supplied to the employer documents showing and describing the contractor's proposals for the design and construction of the works (Contractor's Proposals)

The contractor's obligations are expressed in the following terms:

> The Contractor shall carry out and complete the Works in a proper and workmanlike manner and in accordance with the Contract Documents

The Contract Documents are defined in the contract as comprising:

> the Agreement and these Conditions together with the Employer's Requirements, the Contractor's Proposals and the Contract Sum Analysis.

3.10.3. A difficult situation arises if there is a discrepancy between the employer's requirements and the contractor's proposals. This is a common occurrence in practice: for example, the employer's requirements may call for engineering bricks below the damp proof course, whereas the contractor's proposals allow for semi-engineering bricks, either type of brick being fit for the purpose. It is clear, however, that an instruction would have to be issued as to which of the alternatives is to apply. The contract is silent as to how this type of discrepancy is to be dealt with, but a clue as to how the situation can be resolved is contained in the third recital, which states:

> The Employer has examined the Contractor's Proposals and subject to the conditions is satisfied that they appear to meet the Employer's Requirements

It is arguable that, as the employer has declared that he has examined and is satisfied with the contractor's proposals, any discrepancy between the employer's requirements and contractor's proposals which comes to light after the contract has been entered into should be interpreted in the contractor's favour. There is, however, no authority for this

argument. An amendment to the wording of the third recital should be made to indicate which takes precedence.

3.10.4. The GC/Works/1 Design and Build contract is reasonably clear as to which of the employer's requirements or the contractor's proposals takes precedence. Condition 2(2) states:

> In the case of discrepancy between the Employer's Requirements and either the Contractor's Proposals or the Pricing Document, the Employer's Requirements will prevail without adjustment to the Contract Sum.

Further references to discrepancies are made in condition 10A, which states:

> To demonstrate compliance with the Employer's Requirements the contractor shall ensure that relevant work will be the subject of a Design Document.

Condition 10A(7) develops the theme further, by stating that:

> In case of any discrepancy between Employer's Requirements and Design Documents the Employer's Requirements shall prevail, without any adjustment to the Contract Sum.

'Design documents' are defined as any drawing, plan, sketch, calculation, specification or any other document prepared in connection with design by the contractor. The intention is to catch any document, whether prepared prior to the submission of the tender or subsequently prepared by the contractor for design purposes. All these documents will be subsequent to the employer's requirements.

3.10.5. The ICE Design and Construct Conditions are also clear as to the priority of those key documents, in that clause 5(b) states:

> If in the light of the several documents forming the Contract there remain ambiguities or discrepancies between the Employer's Requirements and the Contractor's Submission the Employer's Requirements shall prevail.

3.10.6. The Engineering and Construction Contract (NEC 3) is completely silent on the matter. It will therefore be a matter of proper provision being included in the Works Information.

3.10.7. A court may take the view that, whilst the Employer's Requirements and Contractor's Proposals are silent with regard to a particular item of work, the requirement to have the work undertaken was obvious (*Williams* v *Fitzmaurice* (1858)). For example, a door will always require ironmongery and a house will require flooring. This being the case, it should have been included for in the contractor's price.

SUMMARY

Unfortunately, the JCT Design and Construct Contract does not address the difficulty, which may arise where there is a conflict between the employer's requirements and the

contractor's proposals. The contract is silent as to which will take precedence. It is likely, however, that a court would hold that the contractor's proposals take precedence as the recitals indicate that:

> the Employer has examined the Contractor's Proposals . . . and is satisfied that they appear to meet the Employer's Requirements.

The ICE Design and Construct and GC Works/1 Design and Build contracts make it clear that the employer's requirements will take precedence over the contractor's proposals. The Engineering and Construction Contract (NEC 3) contract is silent on the matter.

3.11. Is the contractor entitled to payment for design in full when the design work has been completed, or should payment for design costs be spread over the value of work as and when it is carried out?

3.11.1. Contracts which are well drafted will usually be precise as to how much is to be paid or the manner in which payment is to be calculated and the timing of the payment. Design and construct contracts are no exception, and so the contract should be clear as to when payment for both the design function and construction of the works is to be made.

3.11.2. Contracts such as GC/Works/1 Design and Build provide for milestone payments. This being the case, the milestone payment chart should make it clear when payment for design is to be made. In considering the make-up of each payment, consideration should be given to the contractor's pre-contract and post-contract design costs. Provision for payment of the pre-contract design costs should be included in the first milestone. The post-contract costs should be costed in accordance with a design programme and allocated to the appropriate milestone. Condition 48B provides for mobilisation payments if stated in the abstract of particulars. The calculation of this payment would normally include pre-contract design costs. Where milestone payment and mobilisation payment provisions do not apply, payment of the pre-contract design costs should be included in the first advance on account. Design costs should be included in subsequent advances on account to accord with the progress of the post-contract design.

3.11.3. JCT Design and Build Contract is similar to GC/Works/1. Payment method Alternative A provides for stage payments. The analysis of stage payments included in the contract particulars should make it clear in which stage the pre-contract and post-contract design costs will be paid. If Alternative A does not apply, Alternative B comes into operation. In this case, payment of the pre-contract design costs should be included in the first interim payment and the remaining design costs to be included in subsequent payments to suit the progress of the design. In like manner to GC/Works/1, JCT Design and Construct Contract provides an option for an advance payment to be made. Such advance payment would normally include pre-contract design costs.

3.11.4. ICE Design and Construct makes provision in clause 60(2)(a) for a payment schedule to be included in the contract. This schedule should make it clear as to when payment for pre-contract and post-contract design costs are to be made. If there is no schedule, design costs should be dealt with in the same manner as Alternative B of the JCT Design and Build Contract. No provision is made for advance payment or mobilisation payment.

SUMMARY

Payments should reflect the fact that design costs comprise pre-contract design costs and post-contract design costs. Where stage or milestone payments apply, these costs should be properly allocated to the appropriate stage or milestone. The first stage payment should include for pre-contract design costs. If there is no provision for stage or milestone payments, the first interim payment should include all of the pre-contract design costs. The post-contract design costs should be included in subsequent interim payments, to suit the progress of the design.

3.12. On a design and construct project, where the architect is novated from the employer to the contractor, is there any impediment upon the contractor's ability to recover from the architect loss he suffers because of architect design errors which occurred during his employment by the employer?

3.12.1. It has become a common practice for employers wishing to enter into a design and construct contract to start off the process by appointing an architect themselves. The intention is for the architect to be involved in the planning application and to work up the design to a state where tenders from contractors can be sought. When the contractor is appointed, the architect, by way of a novation agreement, becomes a part of the contractor's team. Under the novation agreement the contractor takes responsibility for the work carried out by the architect both pre- and post-contract.

3.12.2. The wording of the novation agreement provides for the contractor to stand in the employer's shoes with regard to negligence on the part of the architect. Any right of redress vested in the employer regarding the negligence of the architect in the pre-contract stage is transferred to the contractor. Contractors have derived comfort from this arrangement. They considered that any loss incurred as a result of an architect's pre-contract error could be recovered from the architect.

3.12.3. In the case of *Blyth and Blyth* v. *Carillion Construction Ltd* (2001), the architect was responsible for design errors in the pre-contract stage, which resulted in the contractor incurring additional cost. The novation agreement allowed the contractor to pursue claims against the architect which would have been available to the employer. In other words, whatever loss the employer would have incurred resulting from the design errors was recoverable by the contractor. The design errors affected the contractor's price, but would not have involved the employer in any additional cost. The contractor therefore

recovered nothing. This will have come as a shock to regular design and construct contractors. Serious rewriting of novation agreements was obviously necessary as a result of this decision.

3.12.4. The CIC/Nov Agr novation agreement published in 2004 by the Construction Industry Council deals with this problem. In clause 4(a), the consultant warrants to the contractor that all services provided to the employer have been performed in accordance with the terms of the original appointment.

SUMMARY

Under a design and construct contract, the contractor takes responsibility for all design work carried out both pre- and post-contract. Often, however, the employer engages an architect to produce a preliminary design and secure planning consent. The intention of a novation agreement is to transfer the architect's design obligation in the pre-contract stage from the employer to the contractor. Comfort can be drawn by the contractor from the novation agreement concerning design errors due to negligence by the architect which occurred in the pre-contract stage. Whilst the contractor can be held responsible to the employer for the design errors, redress by the contractor can be sought from the architect. Unfortunately, due to the particular wording of many novation agreements, as the employer is unlikely to suffer loss due to an architect's negligence as the risk has been transferred to the contractor, he in turn can recover nothing from the architect.

The CIC/Nov Agr novation agreement published in 2004 by the Construction Industry Council deals with this problem. In clause 4(a), the consultant warrants to the contractor that all services provided to the employer have been performed in accordance with the terms of the original appointment.