

## CONFERENCES AND COURSES

### LINCOLN COLLEGE OF TECHNOLOGY

It is announced by the Lincoln College of Technology that a Day-Release Course for the Second Examination of the Institute of Quantity Surveyors will commence in September 1979. The running of the Course is dependent on the number of students so applications should be made immediately to either P. B. Johnson (Head of Building Department) or P. G. Brown (Course Tutor) at the College, Cathedral Street, Lincoln.

### EUROTECH MANAGEMENT DEVELOPMENT SERVICE

Eurotech, whose aim is to provide a high quality post-experience management service, has recently produced its brochure giving details of all its events from May 1979 to December 1980. The programme covers such areas as Executive Development, General Management and Law, Communication Skill Development, Finance, Marketing, Selling, Personnel Management, Production and Purchasing Management and Research and Development.

Full details and booking forms can be obtained from: The Eurotech Development Service Limited, 13 Holder Road, Aldershot, Hants.

## Practice and Parliamentary

### ARBITRATION IN CONSTRUCTION AND ENGINEERING CONTRACTS

By J. T. Edwards, BSc, ACGI, FICE, FCIT, MConsE

*This article first appeared in the journal of the Chartered Institute of Arbitrators and is reprinted by kind permission.*

#### Situations in Construction Contracts Leading to Disputes

My contribution is to outline some of the ways in which disputes in the construction industry arise.

Motor cars despite standardisation, precise repetition, inspection during and after manufacture as well as testing, are often found by the purchaser to have faults. Faults inevitably lead to dispute.

Two or more civil engineering works may be physically similar but rarely identical and the location, ground conditions and weather during construction are invariably different. Thus each is unique. In such circumstances, causes of disputes are also likely to vary. The likelihood of a major project being completed without a dispute is thus small and disputes should therefore be considered normal. Later I deal with what is a dispute.

As the love of money is the root of evil, so is the wish for money at the root of every dispute or claim. Thus particular attention should be paid to those aspects of the contract bearing directly on entitlement to money.

In describing causes of dispute I will be referring, in some cases, to the FIDIC International Conditions of Contract for Civil Engineering Works and will, at times, quote clause numbers from the Third Edition. This is done not because there is any need to refer to that document, but to give an added interest for those familiar with the document.

First, I will look at some disputes which arise from the type of contract. Then I will examine the contract documents and identify common causes of dispute. Finally, I will draw attention to some of the disputes which arise during the performance of the contract.

Whatever the type of contract, the procedure for opening and evaluating tenders has a bearing on the likelihood of subsequent disputes.

The simplest and, in my view, the worst procedure, is the public opening and declaration of the lump sums quoted with the subsequent award to the lowest tenderer. This procedure is likely to become more common since it is believed by its advocates, to reduce the opportunity for corruption. It does,

however, have the consequence that all errors, misunderstandings and deliberate fiddles are likely to become the sources of disputes. It is a method to be deplored.

If the tenders are opened privately several subsequent courses can be followed:

1. The engineer checks for compliance with the documents and for errors. Gross failure on either account is usually pointed out to the tenderer who is given the opportunity to withdraw. Minor errors or lack of compliance may be either not noticed or not pointed out and such cases can lead to dispute, particularly when minor errors later have major effects, e.g., low rate, greater quantity. Some engineers and employers require adherence to sum on tender form.
2. Similar, but tenderer is given opportunity of pricing errors or omissions. This is desirable if much variation in quantities expected. Otherwise disputes arise if low rates applicable to small quantities have to be applied to large quantities.
3. The engineer checks for compliance and errors but in addition identifies all points of doubt. All such matters are put to the tenderer and if the contract is based on design details being provided by the contractor, this may involve 100 or so questions and answers. Depending upon the type of work and experience of the tenderers this may result in the award not being to the tenderer with the lowest initial tender sum. If the tender includes financing the tender may also not be awarded to the lowest tender sum because of the big effect of interest rates on the value of long-term loans.

The last procedure is a means of identifying the 'best buy'. It should result in both parties being fully aware of their obligations under the contract and that should reduce the likelihood of dispute.

#### Types of Contract

The financing provisions in the contract may affect disputes arising from other causes but in themselves may cause dispute. The range of possible financing is large. From on the one extreme negative finance to at the other extreme all contract finance as a loan from the contractor. Negative financing by the contractor arises where he is given an advance by the employer for constructional plant and materials. The normal case is the contractor finances 2-4 months' work until receiving payment from interim valuation of work done. The contractor has even then to finance part of his own work up to the time of receiving payment of retention money. No separate financing provision is made in the contract. A

common ground for dispute in this type of contract is inadequate provision made in interim certificates for claims for extra work or for enhanced rates for existing work. Part of the dispute will then be the financing of the delayed payment.

The same interim valuation basis may be coupled with ECGD type of finance for materials and some other costs.

The other extreme is where the contractor provides a loan for part or even the whole of the works. If the employer has cheaper money he may wish to pay the contractor early in the contract thus leaving the contractor's dearer money for part of the contract to later when period for interest is less. This may lead to dispute if the time at which the contractor's finance is to be taken up has not been defined when the contract has been accepted.

On-demand performance bonds are not only an additional cost to the contractor but obtaining a bond for a large contract may restrict a contractor's opportunity to obtain other finance for the contract. The unjustified calling of a bond may lead to a dispute because the consequential damage to the contractor's reputation may make it difficult to obtain future finance or bonds.

Clause 72 provides that if payment is to be made to the contractor in more than one currency, the rate of exchange shall be that ruling 30 days prior to tender and there shall be no subsequent variation. If the contractor is foreign and has, as usual, appreciable expenditure outside the country of contract, this can lead, if the rate moves against him, to hardship and inevitably to dispute. Naturally if the rate moves in his favour he expects to keep the benefit.

Payment under a contract may be a lump sum, a series of lump sums or by ad-measurement at contract rates of the work done. In each of those cases the works may be designed in detail by the engineer or by the contractor.

There is a theory held by some that a lump sum contract with detailed design by the contractor leaves the minimum scope for subsequent dispute. Another school holds that an engineer's complete design with provision for remeasurement of the works as constructed is the optimum procedure. The type of works to be constructed has a big influence on which of these two schools of thought is likely to be right. But in either case grounds for dispute will appear if the works to be constructed or the circumstances during their construction differ appreciably from those set out or implied in the tender documents.

Contracts based on the engineer's design may include nominated sub-contracts. It is normal for specialist nominated sub-contractors to design their products or work. Such sub-contracts can together form an appreciable proportion of a contract. Although the sub-contractors are in general required to be under the same Conditions of Contract as the main contractor, there are so many openings for dispute and some are mentioned below.

It appears that the Japanese consider that a contract is an agreement to carry out the works at the contract price only if the works and the circumstances of their construction remain exactly as both parties envisaged at the time of signing. Any variation obliges both parties to agree an appropriate change to the contract. This attitude brings many ground for dispute additional to almost all those I mention for other international contracts.

## **Documents Forming Contracts**

### *Conditions of Contract*

The International Conditions of Contract (the FIDIC Conditions) may, by their adoption, raise the quality of tendering.

But by their nature of Part I being standard and yet being added to or varied by Part II written by the engineer for each project, discrepancies arise between the two parts leading to disputes. For major projects that risk can be minimised by merging Parts I and II under the guiding hand of an experienced lawyer.

A future development which keeps the Standard Part I and introduces a Standard Part II for a particular country leaving any variations for a particular project to be defined in C1.1 of the Specification would reduce the opportunity for disputes.

Some disputes arise not from error in or misinterpretation of the Conditions of Contract but from the very provisions made in the document. Some examples are:

Any change in costs arising from changes in legislation shall be certified by the engineer and paid to or back by the contractor. Some Governments will not permit such a clause, taking the line that it overrides provisions made by their legislation. Changes in income tax are a particularly sensitive matter whereas changes in customs duties appear not to be such a problem.

A similar source of dispute is a provision which excludes part of any sum calculated under an escalation clause. The productivity element in labour increases currently excluded from UK Government contracts is an example.

Rates of exchange are to remain unchanged. This can be a burden to employer or contractor, particularly for large long-term contracts. The concept seems to be inconsistent with the principle which allows for changes in costs arising from changes in legislation. If the rate of exchange is varied by legislation, which clause is applicable?

Liquidated damages. If a large sum is applied to the whole of the works, then if the failure to complete a small part is used as ground to call for the whole sum a dispute arises. The provision for *pro-rata* diminution applies only when the employer has occupied or used the completed part. Such dispute may be avoided by specifically relating the liquid damages to the vital parts of the works. A dispute also arises when a sub-contractor fails to complete his work and is told by the main contractor to bear the whole cost of the liquidated damages. The sub-contractor may feel like the maker of the missing nail which caused the loss of the horseshoe and in turn the battle.

A variant of this arises under FIDIC Third Edition where a nominated sub-contractor, who designs his work, has to indemnify the contractor against failure. The value of his indemnity risk may far exceed his possible insurance cover.

If the language of the contract, the ruling language, is not one in which the technical vocabulary is well developed and defined, disputes in interpretation will arise since even English technical words are not always without doubt in their meaning – when is an elevator not a lift?

Standard Conditions of Contract assume that the engineer is independent of the employer and appointed under agreement with the employer. It is now common for large public and private bodies with a technical capability to appoint a staff member as the engineer. This relationship can lead to allegations of lack of impartiality in the engineer's decisions and hence to dispute. The practical difficulty exists that if the engineer is privy to all the employer's internal policies, problems and politics, it may be almost impossible for him to exclude from consideration factors which are not strictly relevant to the contract. The Third Edition of the FIDIC Conditions provides for those clauses to be defined under which the engineer has to have the specific approval of the employer to act. That may prove to be satisfactory where the engineer is independent, but

an employee may, by the terms of his employment, be obliged to follow all his firm's regulations concerning the whole range of his duties as the engineer and thereby lead him to act truly as the employer's servant.

If the works have been designed by an independent consulting engineer the engineer, in such a case, may delegate some of his powers relating to design or site supervision to the consulting engineer. But the consulting engineer does not normally become the engineer's representative.

Unless such delegation is provided for in the contract, then the consulting engineer must be given standing under the contract by amendment to the Standard Conditions of Contract. If that is not done the engineer himself may be in no position to obtain from or give to the consulting engineer all the powers of approval required under the contract. The CEGB, for example, provide for such delegation in C1.1 of the Specification.

### **Bills of Quantities**

International contracts as we know them today had their origins in the great public works in the last half of last century and early years of this – notably railways and irrigation projects. There is much evidence that the Bills of Quantities were brief by recent standards.

Yet complex methods of measurement, including the numerous labour only items beloved by QS, are of considerable antiquity and were used during the building of St. Paul's Cathedral at the end of the 17th century.

The old ICE Standard Method of Measurement did not, because of its paucity of specific requirements, lead to more disputes than the current version will generate in similar circumstances. The more precise current method, like the Standard Method for Building Work, leads to claims based on the argument that a particular detail of work occurs in a project and is provided for in the Standard Method but is not included in the Bill of Quantities and must, therefore, be an omission from the Bill. A conventional view is that if the Bill has been prepared by the engineer strictly according to the Standard Method such disputes will not arise. But as I explain later, often full drawings are, for good reasons, not available at time of tender and so Bills derived from them may well be incomplete however competent the compiler of the Bill.

Many disputes arise from the Bill of Quantities. The majority are in two groups. One comprises the effect of large increases (or may be reductions) in amounts of individual items or similar items taken together. The other comprises items of work where the completed part of the Permanent Works is more or less exactly as described in the documents but the contractor claims that the cost of the operation has been increased for reasons outside his control.

Changes in amounts of quantities may be the consequence of drawings being issued showing the required Permanent Works in greater detail. They may not arise from an intentional variation. The contractor is entitled to put forward for the engineer's approval a new rate for the increased quantity. It would be unusual for the contractor to propose a lower rate, but the engineer will usually expect one on the grounds of better utilisation of plant and lower overheads. That is the making of one of the commonest grounds for dispute. Such cases are rarely clear-cut. As an example, a contractor introduced an additional concrete batching plant located on a separate part of the site. He claimed it was required solely on the grounds of the increased quantities. The engineer showed that the existing plant could have met the required

rate of output and that, whereas the additional concrete plant was lying idle on a nearby site, its introduction at small cost enabled a number of lorries used for concrete haulage to be transferred elsewhere where they were urgently needed. The contractor probably acted in good faith but his actions gave him, overall, a better financial return.

The other major group of contentious items are those where the Permanent Works are unchanged but the effort in their execution has been increased – again the contractor does not usually complain about easier working conditions. Whilst his shortage of labour or wet weather, neither of which entitles him to an extension of time, may be the cause of the work taking longer, the lack of a drawing at the programmed date, even though it was available in time for his later working, may well be the basis of the dispute.

### **Specification**

Specifications often quote as a standard of quality 'best of their respective kinds' or British Standards. Words like the first definition mean that an interpretation, such as, say, for floor tiles, it is the best of a cheap type of tile. The bald reference to a British Standard can be equally the cause of a dispute. Many British Standards specify different classes of materials covering varying strength requirements and other factors which have a major affect on cost.

The contractor is responsible for the design of Temporary Works and the method of execution of the Permanent Works. Specifications should, ideally, either define the end product and leave to the contractor the decision on the intermediate steps and parts to be produced or detail the steps by which the contractor is to achieve the end and assume that the end product so formed will be satisfactory. In some cases both methods are used which results in 'over-specification' or a 'redundant specification'. A very common example is the specification of both the precise ways of making concrete and the strength to be achieved. If the specified way does not result in the specified strength, a dispute arises. In other cases part of the manner of execution and some of the properties of the end product are specified. This usually leads to the end product complying with the contract but not being up to the engineer's expectation. The resolution of that type of dispute often includes settling who pays for demolition and rebuilding with consequential costs and delays.

A source of disputes arising from international contracts which ought to be reduced to a rarity is the specification of a practice which may be typical in one country but unknown in the country where the work is to be carried out.

### **Drawings**

Drawings are obviously important since they are the principal method by which the works to be executed are defined in the contract. But the definition of the drawings is the drawings referred to in the specification. The specification is, however, defined merely as the specification referred to in the tender and the tender is not defined.

But starting from the definition of the Permanent Works as the Permanent Works to be executed in accordance with the contract, then the definition of the contract includes, *inter alia*, the specification and drawings. Thus the Permanent Works are defined by the specification and drawings read together. Some information given in the form of schedules may be either in the specification or on drawings. Whilst the engineer has power to supply further drawings and a duty to supply drawings requested by the contractor, the issue of drawings not specifically referred to in the specification may constitute a variation of the contract and thus lead to a dispute.



The straightforward civil engineering projects like roads, bridges and docks which do not have a high proportion of E & M plant can be shown on the tender drawings in such detail that either no additional working drawings are required or those which may be necessary are an amplification and not a variation. Projects such as power stations have major parts of their civil engineering works which cannot be designed until separate E & M contracts have been let. Inevitably the tender drawings for the latter type of civil engineering contract do not truly represent the works to be built. If one hundred tender drawings are followed by one thousand working drawings, there is bound to appear an argument that the character of the works have changed. Indeed, claims on various grounds but based primarily on the change indicated collectively by the later drawings may well form the majority of all disputes.

#### **Disputes Arising from the Provisions of the Contract**

I now turn to disputes arising not from errors or lack of clarity in the contract documents, but from the application of the provisions in the document.

If the rate of progress is too slow, the engineer may order the contractor to take steps to improve the rate. The engineer sometimes tells the contractor that his steps are inadequate before being proved so, and goes on to tell him what would be adequate. That action often leads to dispute and is one of a group involving an engineer's instruction. A statement, or even comment, by an incautious engineer's representative may often lead to a claim based on an alleged issue of an instruction.

Under the contract which has the Permanent Works designed by the engineer, the contractor is not responsible for loss or damage from a cause solely due to the engineer's design of the works. The contractor is responsible for the care of the works, which includes the Temporary Works. In some types of work, for example, building a pumphouse within a temporary sheet piled cofferdam, the Temporary Works, if they fulfil the purpose for which the contractor has designed them, have no effect on the Permanent Works. In some other types of work, for example, erecting major bridges, the Temporary Works have a major effect on the loads to be taken by the Permanent Works during their construction, but neither the Temporary Works nor the partly-completed Permanent Works can be considered separately. If the engineer has not also designed the Temporary Works, disputes can easily arise in the relative responsibilities of the contractor and the engineer. The Standard Conditions of Contract will be applicable if the engineer specifies an erection scheme but leaves its detailed design to the contractor, who thus retains full responsibility for both Temporary and Permanent Works until completion. It should be noted that exclusion of the contractor's responsibility for damage from a cause solely due to the engineer's design applies to the works and not just the Permanent Works. Thus no difficulty in defining responsibility arises just because the engineer may design the Temporary Works. Disputes stem from the lack of definition in the contract.

If the Permanent Works are to be designed in detail by the contractor then the starting point of his design must be fully defined. A bald specification of, say, a TV mast 1,000 feet high, or a storage shed 100m x 20m, is a start but in practice just the foundation of a dispute. The employer must provide a detailed specification of his requirements or he must obtain a detailed proposal from a contractor which can be evaluated by an engineer to see that it fulfils his requirements, if a major dispute is to be avoided. Such a package deal or so-called

design-and-construct contract can be arranged without such pitfalls if the employer retains a consulting engineer, but often the employer thinks he will save money by not doing so.

Before leaving the subject of design, I would recall that the profession of civil engineering is defined as the art of directing the great sources of power in nature. Whilst an opinion on the fine arts may provoke dispute, engineering judgement is one of the principal arts in the direction of those sources of power in nature and that art of judgement is normally the view which would be held by all competent engineers. The art of engineering is evolving and what may be settled only by proper engineering judgement one year, may be calculable or proven the next year. Even if such a development has not occurred, hindsight often makes a correct judgement appear later to be an obvious error.

#### **Disputes Arising from Type of Work**

Work in existing public highways may be greatly influenced by changing access conditions and the influence of traffic during contract – not a Cl. 12 situation – that is an unforeseen physical condition.

Work on site formation roads may have been planned for summer conditions but executed in the winter because of changes to programme. Cl. 22 requires the contractor to indemnify the employer against damage to property except if the damage is the unavoidable result of the execution of the works. It does not say on the one hand unavoidable at any cost, or on the other hand unavoidable at no extra cost. The employer has to indemnify the contractor against all such claims in respect of unavoidable damage. It should be noted that there is no onus on the engineer to decide beforehand what is avoidable. This position leads to disputes when piling or tunnelling which frequently cause damage to adjacent property, is required for the works.

It is a curiosity in Cl. 45 that whilst Permanent Works may not be carried on during the night or on Sundays, there is no such restriction on Temporary Works. Thus driving temporary steel piles is permitted but some quiet concreting is forbidden. This restriction can be onerous and, therefore, leads to a dispute.

#### **Changed Circumstances**

Cl. 12 excludes climatic conditions on the site as one of those unforeseen physical conditions which entitle the contractor to payment for the additional consequential costs. But a common exception to that is in places where typhoons occur, the number and duration of which cannot be foreseen by the most experienced contractor, an extension of time would be given for the duration of an official typhoon-strength wind. Usually the climatic conditions have, under Cl. 44, to be exceptionally adverse for an extension of time.

A wide range of disputes stem from those provisions. Examples are flooding on the site from a swollen river caused by heavy rain off the site. Is flooding a climatic condition or merely a consequence, and is it not a physical condition? What about landslips which are physical conditions affecting the works? How experienced and foreseeing does a contractor have to be on such matters? Yes, as much as a reasonably experienced contractor in that place might be expected to be. A contractor may use the argument that he must be accepted as experienced, otherwise the engineer would not have recommended his tender and he did not foresee such conditions.

Cl. 42 provides that if there is a delay in giving possession of the site, the engineer *shall* grant an extension of time for the completion of the works. The extension may be longer or

shorter than the delay but Cl. 44 says that if the delay be such as fairly to entitle the contractor to an extension the engineer shall determine the amount. Thus the engineer has no power not to grant an extension but the amount is in his discretion. Disputes usually arise over the consequential delays arising from the initial delay.

The engineer is also obliged to certify such a sum as in his opinion shall be fair to cover the cost incurred. There may be savings due to the delay arising directly, say, from a reduced cost of a shorter period of watching and lighting or from a shorter time of use of plant, temporary buildings, etc. If the engineer takes such savings into account in deciding a fair cost, that may lead to a dispute. But the engineer may decide there is no extra cost due to a delay in possession of the site.

A frequent basis of dispute arising from delay is that the engineer has not taken account of indirect additional costs such as uneconomic working and the increased cost of materials and labour between the programmed and actual date of construction.

#### What is a Dispute ?

The ICE and FIDIC Conditions appear to postulate that there are disputes as well as differences of any kind whatsoever. Two such different animals may well be part of legal mythology but to engineers a dispute in their jargon is a formal disagreement, whereas differences of any kind whatsoever include an argument over the maintenance of the transport for the Resident Engineer and are dealt with in ways other than arbitration.

The FIDIC Conditions provide that if a dispute arises between the employer and the contractor or the engineer and the contractor, it shall be referred to the engineer who shall give his decision within 90 days. Engineers do not normally refer matters to themselves although they may well talk to themselves. The effect is that the initiative in a disagreement between the engineer and the contractor lies with the contractor. One consequence may be that the contractor, having lodged a request for additional payment and having had it turned down by the engineer, waits for a long time in the hope of more favourable circumstances arising before asking the engineer for a formal decision, which he knows has to be given within 90 days. Another consequence can be that the contractor later alleges that it was not a formal engineer's decision.

It is fairly common that during the 90-day period the employer and the engineer reach a conclusion that payment of a sum acceptable to the contractor will be cheaper in all parties than going to the next step of arbitration. The majority of disagreements do not reach arbitration.

One disadvantage of this procedure is that a very long time may elapse between the initiation of a claim by the contractor and its settlement even without arbitration. This long period is in no-one's ultimate interest. Even if the contractor gets more money, he has had to wait a long time and incurred interest charges, and the employer may have had funds locked up. A delay causes people to be dispersed, loss of memory, bad feeling and souring of future relations.

One way of improving this position is to give the engineer the power to initiate the dispute procedure. The Conditions of Contract can have an additional clause which provides that if the contractor does not accept an opinion on instruction of the engineer and the engineer does not vary it to the satisfaction of both, or withdraw it, the engineer shall declare that a dispute exists and require the contractor to submit his case for formal decision within 90 days.

It may sound to be heresy, but it must be in the national interest for a minimum of engineering skill to be spent on creating and resolving disputes. Anything which can be done along that line to improve the national engineering productivity must be in our long-term interest.

I have touched on only some of the causes of disputes in the construction industry. Nevertheless even these examples are sufficient to show that there seems every prospect of a prosperous future for the judges, lawyers and arbitrators involved in the settlement of disputes.

#### Editor's Note

Mr. Edwards has asked that readers note that the article above is a record of the spoken word and has not been written specially for publication.



"He's here in a Quasi-Judicial Capacity"

## A PRACTICAL APPROACH TO THE DESIGN OF NEW AND EXISTING ROOFS WATERPROOFED WITH MASTIC ASPHALT

By G. J. Gillam, DiplArch, RIBA

Mr. Gillam is a consultant architect on the application of mastic asphalt.

### CRITERIA AND ESSENTIAL LIMITATIONS

#### ESSENTIAL READING AND REFERENCE

British Standard Code of Practice CP 144 part 4 1970.

#### ROOFING AND PAVING GRADES OF MASTIC ASPHALT

#### Waterproofing Membrane

Mastic Asphalt for roofing is either BS 988 limestone aggregate or BS 1162 natural rock aggregate. BS 988 – this is a man made material consisting of bitumen, flux oil and limestone powder, mixed together with the assistance of heat. BS 1162 – this is manufactured as above but the materials are natural rock asphalt as mined crushed and compounded with other materials. The performance standard of either material appears identical. There are two specifications for BS 988 limestone aggregate mastic asphalt, these are (B) or (T):