12 Design: contract documents

12.1 Responsibility for documentation

Contract documents are drawn up by the client, or his representative, in order that contractors can make their offers and the successful one carry out the work. The documents need to provide the definition and understanding of the work to be undertaken, how it should be done and the relationship between the parties.

Behind this simple description lie potential problems, misunderstanding, dispute and litigation. This is true for all forms of construction, but is particularly true for works below the earth's surface where the possibilities of encountering unforeseen conditions are much greater. An experienced engineer, Sir Harold Harding, once said wisely, "In most civil engineering works worthy of the name, the unexpected happens" [132].

The client has the responsibility for preparing the contract documentation, even though his own staff or the engineering group commissioned to design the works may in fact undertake to do this. In some parts of the world the client may turn to a specialist quantity surveying group to take on this responsibility.

Contract documents, and their contents, take many forms according to the nature of the work, the situation, the policy of the client, local custom and the legal framework. Normally they will comprise some combination of four sets of documents: Conditions of Contract, Bills of Quantities, Drawings and Specifications.

12.2 Conditions of Contract

12.2.1 Standard forms

The Conditions of Contract are normally based on some standard form that has been agreed by representative bodies for all parts of the industry. To these are attached the particular conditions which relate to the work to be carried out.

The standard form, such as the British Institution of Civil Engineers (ICE) Conditions of Contract [133] contain opportunities for conflict in nearly every clause. Contracts of this kind have resulted in the development of an adversarial industry.
Some large authorities issue their own conditions, while others amend and add clauses to standard forms. The objective in many cases has been to shift the risk for anything that happens away from the client and onto the contractor. There are many examples where clients have been disinclined to undertake site investigation or provide bidders with available geotechnical information lest claims are made if the information were proved to be wrong. This attitude has led to confrontational relationships between the client, his engineer and the contractor. The client has balked at the high cost of his works, which has become inflated because the contractor has had to cover his risks, and at the high cost of resolving any eventual dispute. Such contracts are often delayed because the parties' interests are not directed to what should be the common goal — the proper and timely execution of the work.

12.2.2 Time for completion

An area fraught with problems is determining what is a realistic period for completion of the works. The client may have very particular reasons for requiring the work to be completed by a certain date. For example, financial benefits may accrue to him if the scheme is put into operation early or he may have to meet commitments to third parties. The client's situation should be made clear in the contract. Bonuses for early delivery or penalties for overrunning time should reflect the true benefit and burden to the client. In general, a contractor objective will be to complete the job in the shortest reasonable period, as by so doing he will minimise his costs. On tight schedules, the progress of microtunnelling and pipejacking can often be accelerated, albeit at some additional cost, by working a second and even a third shift and at weekends. A contractor may also introduce more equipment, including additional TBMs.

12.2.3 Limitations

In the preparation of contract documents it is important to review standard contracts and "boiler plate" clauses to ensure that they are compatible with pipejacking and microtunnelling requirements. Standard contracts were often framed to cover more traditional methods of working. For example, Clauses 11 and 12 of the ICE Conditions of Contract [133] make the contractor responsible for the interpretation of all soil and hydrological information provided by the client for the purposes of constructing the works and for any design responsibility the contractor has to assume. It is further envisaged that the contractor may have to make his own investigation in order to meet his obligations. For a pipejacking or microtunnelling contract, such a requirement could place an onerous and expensive burden on the contractor.

12.2.4 Allocation of risk

To meet the shortcomings of these traditional forms of contract, a number of procedures have been revised. These recognise that a proper allocation of risk can be truly cost-effective for the client, because under traditional contracts the contractor has to allow in his price for any risk. Also time and money are lost in dispute. These revised