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By Steve Revay

In recent years, construction practitioners spent a significant portion of their time and energy on finding solutions for the avoidance or, if not possible, for the resolution of claims. This intense search to find ways and means to reduce, if not entirely eliminate, the adversary atmosphere which plagues so many construction projects today is perhaps the most dramatic illustration of some of the problems facing the industry.

Alternate Dispute Resolution (ADR) and Partnering, the two most often suggested solutions to these problems, unfortunately represent nothing more than a treatment of the symptoms and not a cure for the disease. Although the frequency and the intensity of construction disputes may be lessened by Partnering or the introduction of ADR, neither of these processes alone will yield a cost-effective and dispute-free project. Both Partnering and most forms of ADR, perhaps with the exception of arbitration, lack the means of enforcement and their ultimate success depends on the parties' goodwill. A bullterrier will retain the characteristics of its species even after having been through obedience school. Similarly, a team-building exercise will not alter the behaviour of a contrary minded party, particularly if acting in good faith could cost him large sums of money.

More importantly, the seeds of disputes are usually planted long before the first contractor arrives on site or the team-building exercise can take place. One must, therefore, look for a cure for the disease in the pre-construction phase, that is during the design stage and when the applicable contract documents are being prepared. Equitable allocation of construction risks is considered one of the most powerful weapons in the fight against disputes. The following article offers an analysis of the New Engineering Contract (NEC), recently published in London by the Institution of Civil Engineers (I.C.E.). It is contended that this form of contract goes further towards a dispute-free project than any of the other standard forms in use today.

CAN CONSTRUCTION DISPUTES BE AVOIDED?

Construction is plagued, perhaps more than any other industry, with disputes due to the inherent conflict of interest between the buyers of construction services (i.e. the owner or employer) and the seller of those services (i.e. the contractor). The buyer wants to receive the most value for its construction dollar whereas the seller wants to spend the least amount of money while meeting its contractual obligations. Unfortunately, these obligations are seldom, if ever, stated in clear enough language so as to preclude misunderstandings. Over the years the industry has learned to rely on the design engineer or the architect, i.e. the most likely author of the misunderstanding, to clarify it and to decide on the corresponding responsibilities of the parties. To this extent, the engineer or the architect of record is required to act in a quasi-judicial capacity. This system has worked since time immemorial even though the services of the engineer/architect were paid for by the buyer (i.e. the owner), and perhaps it would still work had it not been for the owner's desire to save time and money during the design stage. Engineers/architects today seldom have enough time or money to complete the design and prepare job specific technical specifications prior to calling for bids. Accordingly, misunderstandings may be the direct result of the gaps left in the incomplete tender documents by the designer. Clarification, therefore, could conceivably mean additions to the scope of work for which the Contractor ought to be compensated. Can any interested party act in a truly independent (i.e. quasi-judicial) manner in such circumstances? Hardly.

More importantly, the increasing complexity of today's projects, with an ever-increasing number of contractors, subcontractors and/or suppliers working to separate contracts, having parallel obligations towards the completion of a technically difficult project in ever-decreasing time periods, inevitably results in extremely complex claim situations. These difficulties are exacerbated by the suspicion of bias or self-interest on the part of the engineer/architect.

To overcome this fundamental problem and to relieve the design engineer/architect of any judicial as well as managerial responsibilities, NEC divides the historical role of the engineer/architect between the Project Manager, the Supervisor, the designer of record and the Adjudicator. Although this is not the only departure from the standard form of contracts in use today, it is probably the most significant.

NEC Evolution

Before dealing with the above-identified functions and the other innovations contained in the NEC, let us examine the reasons for and the history of NEC.

The Institution of Civil Engineers has been publishing contract conditions probably longer than any other organization. The current I.C.E. Conditions of Contract is in its sixth revised edition. Although this form is seldom used on the North American continent, many Canadian and American consulting firms and contractors would be familiar with its terms by way of the use of the Conditions of Contract for Works of Civil Engineering published by the Fédération Internationale des Ingénieurs Conseils, popularly known as the FIDIC Conditions, which is the predominant form of contract in the international arena. The FIDIC Conditions are derived from and modelled on the I.C.E. conditions, including among other things the quasi-judicial powers and significant administrative role of the Engineer.

In 1985, the I.C.E. decided to "lead a fundamental review of alternate contract strategies for civil engineering design and construction with the objective of identifying the needs for good practice".

The first draft of NEC was issued in 1991 and used on a trial basis in the U.K., South Africa, Hong Kong and Belize. As a result of the experience gained during the trials, the language of the contract was revised, but without altering the intended principles and was reissued in 1993 as the First Edition. A NEC Users' Group was launched in January 1994, and in July Sir Michael Latham recommended in his "Final Report of the Government/Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry" that the NEC "be a common contract for the whole industry". The philosophy adopted in the NEC is probably closer to contracting practices found in continental Europe than those governing either the I.C.E. or FIDIC conditions. For instance, the powers of the Project Manager in the NEC are not dissimilar from that of the maître d'oeuvre in France. It would not be surprising, therefore, if FIDIC were to follow the example set by the NEC in the not too distant future.

Changed Roles

The design engineer/architect of record is notably absent from the text; his/her name is not mentioned anywhere and he/she has no obvious say in the carrying out of the contract. Were this apparent relegation of authority of the engineer/architect in favour of that of the Project Manager recommended by the Project Management Institute, it could be more readily understood, but taken less seriously. But coming from the Institution of Civil Engineers, one of the bastions of the classical role of engineers, it deserves more attention. Admittedly, the lead author of the NEC, Dr. Martin Barnes, is a keen student and vocal disciple of the development of project management, but he alone could not likely cause such a major change in the direction of contracting. It is probably safe to assume that I.C.E. has decided that engineers can best serve their fellow human beings by doing what they have been trained for, the engineering and design of environmentally sustainable, quality projects.

The American Bar Association has recently established a task force with the objective of taking a fresh look at construction contracting. The preliminary view of this task force is similar, namely, that the designer of record, that is the classical engineer/architect, ought to be relieved of all quasi-judicial roles.

The Project Manager under the NEC is responsible for and has full apparent authority to deal, on behalf of the Employer (the owner in local parlance), with all the contractual, technical and administrative issues that may surface during the project. Should the Project Manager be limited in his/her power in any manner, such as by the amount of additional compensation he/she may authorize, then an appropriate authorization must be obtained by him/her within the time provided for under the relevant clause(s) of the NEC. Failure to act within the specified time by the Project Manager entitles the Contractor to additional compensation.

With that much power given to the Project Manager, one may ask: what then has changed from the point of view of the Contractor? First of all, the Project Manager is independent of the designer(s) and has neither real nor implied bias or self-interest in covering up gaps in the scope of the work, ambiguities in the specifications or design deficiencies. More importantly, however, should the Contractor consider that the Project Manager's actions or decisions are not in accordance with the contract it may bring its complaint to the Adjudicator. This is a very important safeguard against potential abuse of power on the part of the Project Manager. Additionally, the entire contract, particularly Clause 6 — Compensation Events — is constructed in such a way as to constrain the Project Manager from acting unreasonably.

New Players

The Adjudicator is appointed jointly by the Employer and the Contractor. The Adjudicator becomes involved only when a dispute is referred to him/her. The Adjudicator is therefore independent from the Employer and the Contractor and his/her fees and expenses are shared equally regardless of the decision. Clause 9 of the contract sets out the steps leading to a decision. Specific time limits are provided for each step (e.g. four weeks) thereby establishing the longest duration within which a dispute must be resolved, i.e. 12 weeks. There is, however, no bar to proceeding faster. The decision of the Adjudicator is executory, that is the Project Manager and/or the Contractor must implement the decision. For example, if a decision calls for additional compensation, the so determined amount must be paid in the next progress payment. Notwithstanding the binding nature of the Adjudicator's determination, either party may file for arbitration as long as it advises the other party within four weeks of receiving the decision. The arbitration is governed by the applicable (or agreed upon) Arbitration Act. No dispute may be referred to arbitration unless it has first been submitted to the Adjudicator. A decision by the Adjudicator, however, is not a prerequisite. A dispute may be referred to arbitration should the Adjudicator fail to render a decision within the allotted time. In such a situation, the four weeks limit starts at the date when the decision should have been delivered (i.e. a party may file for arbitration a day after the relevant date).

A new player on the scene is the Supervisor, who is responsible for verifying that the works are constructed in accordance with the plans and specifications and as such is acting as a quasi-resident engineer or a clerk of works. The Supervisor who is appointed by the Employer may be from the Employer's permanent staff or from an independent organization other than the firm of designers. The Contractor has the same rights with respect to a decision by the Supervisor as to that of the Project Manager. If in disagreement with such a decision the Contractor can refer it to the Adjudicator for determination.

The first edition of the NEC is made up of the following parts:

- six versions of the Employer-Contractor form of contract;
- the New Engineering Subcontract;
- the flow charts; and
- the guidance notes.

The Employer-Contractor version, which is the only one being reviewed here, can be used for construction work containing any or all of the traditional disciplines such as civil, electrical, mechanical or building work. Similarly, it can be used whether the Contractor has some design responsibility, full design responsibility or no design responsibility at all. The six versions cover all generally used options such as fixed price contract with schedule of pay items, unit price contract with schedule of quantities and prices, target price contracts, cost reimbursable contracts and management contracts.

The unique feature of the NEC is that its structure and a number of clauses (i.e. the core clauses) are identical in all six versions. Each form of contract is made up of five elements:

- core clauses;
- optional clauses (specific for each of the six versions);
- secondary optional clauses that can be used in any one version;
- schedule of cost components, used to price compensable events;
- contract data, setting out all job specific information.

Job specific requirements and all design related issues are to be covered in the technical specifications, accordingly the NEC is relatively short but flexible.

Core Clauses

There are nine core clauses, three of which contain terms that are materially different from those currently found in standard forms. The authors, however, warn potential users that notwithstanding the similarity between the language used by other contracts and the NEC, this is a totally revised contract and should not be applied without thorough understanding. The three clauses are:

- 6 — Compensation Events;
- 8 — Risks and Insurance;
- 9 — Disputes and Termination (which has already been discussed).

Clause 6 sets out sixteen causes which entitle the Contractor to additional compensation, including the following:

- "A test or inspection done by the *Supervisor* causes unnecessary delay", or
- "If there is an inconsistency within the Site Information (including the information referred to in it) the *Contractor* is assumed to have taken into account the physical conditions more favourable to doing the work."
- "Weather is recorded within a calendar month and before the Completion Date for the whole of the works at the place stated in the Contract Data which one of the *weather measurements*, when compared with the *weather data*, shows has occurred on average less frequently than once in ten years."

This Clause also describes the notice requirements to safeguard the Contractor's entitlement, as well as the method to assess the amount of compensation. Impact cost, for example is treated as follows:

- "If the *Project Manager* decides that the nature of a compensation event is too uncertain for its effect to be forecast reasonably, he states assumptions about its nature on which assessment is to be based when he instructs the *Contractor* to submit quotations. If any of these assumptions is later found to have been wrong, the *Project Manager* notifies a correction as a compensation event."
- "Allowances for cost-increasing and delaying factors which have a significant chance of occurring and which are at the *Contractor*'s risk under this contract are included in forecasts of Actual Costs and Completion" — that is the so estimated amounts are to be paid to the Contractor.

The reason for this apparent leniency towards contractors, according to the authors of the NEC, is the recognition that none of the events which are the subject of compensation have resulted out of a fault of the Contractor, accordingly it is fair and reasonable (and is in compliance with the law of damages) to reimburse the Contractor for those additional costs which it would not have sustained but for the event in question.

Clause 8 describes how the risks of loss or damage to physical property and of personal injury or death are allocated, procedures for dealing with the loss, damage, injury or death when these risks happen, the liabilities to which the parties are exposed, the indemnities provided by the parties and the insurance requirements. One unique feature of this clause is that it relieves the Contractor of responsibility for loss or damage to the permanent works even during construction, if it has resulted from a fault of the Employer or his design. Also it relieves the Contractor from the risks of war, radioactive contamination, and any other specific risks for which the Employer has accepted responsibility and listed in the Contract Data (such as environmental issues or contaminated soil, etc.)

Important Options

Among the Employer-Contractor form of contracts the target price and the management contracts deserve special comments.

Target price contracts, when first introduced, were heralded as the ideal solution to projects where construction must start prior to the design being completed (i.e. fast track projects). Their anticipated popularity, however, has quickly waned primarily due to the difficulties encountered in adjusting the initially agreed prices.

The NEC appears to sidestep this problem and recommends that the compensation event procedure is to be applied to changes. In the case of a target price contract with bill of quantities and prices it is stated that:

- "The difference between the final quantity of work done and the quantity for an item stated in the bill of quantities at the Contract Date is a compensation event if:
- the difference causes the Actual Cost per unit of quantity to change, and
- the rate in the bill of quantities for the item at the Contract Date multiplied by the quantity of work done is more than 0.1% of the total of the Prices at the Contract Date.

A difference between the final total quantity of work done and the quantity for an item stated in the bill of quantities at the Contract Date which delays completion is a compensation event".

There is a great similarity between the conditions governing the fixed price and the target price contracts. The procedure provided for the adjustment of prices in case of experiencing changes or other compensation events, as described above, is identical for both versions. The difference is that the tendered target prices exclude overhead and profit which are covered by the Fee that, of course, may be reduced by sharing cost overruns in accordance with the

agreed upon formula. In the NEC the protection of a minimum Fee is achieved by setting in the Contract Data an appropriate range over which the sharing applies.

In the Management Contract the responsibilities of the Contractor are the same as those in other main options with the exception that the Contractor does not undertake work itself and all work is subcontracted. The services are limited to the construction phase and if the Employer requires substantial pre-construction services then a separate service contract ought to be signed.

The subcontract prices are paid to the Management Contractor as Actual Cost, understanding that these prices can vary only pursuant to the compensation event process. Additionally, he receives payment of the tendered L.S. Fee which covers the cost of supervision, administration and design (if required) as well as profit. This fee will increase as subcontractor's prices increase due to compensation events, but not for the cost of services required to administer compensation events. As can be seen, the Management Contract is, in reality, a fixed price contract, although total price is determined only after all subcontracts have been awarded.

Secondary Options

After deciding on a main option, the user may choose any of the secondary options. However, it is not necessary to use any of them. The secondary options are:

Option G	Performance bond
Option H	Parent company guarantee
Option J	Advanced payment to the Contractor
Option K	Multiple currencies
Option L	Sectional Completion
Option M	Limitation of the Contractor's liability for his design to reasonable skill and care
Option N	Price adjustment for inflation
Option P	Retention
Option Q	Bonus for early completion
Option R	Delay damages
Option S	Low performance damages
Option T	Changes in the law
Option U	Special conditions of contract

Conclusions

All in all, the NEC appears to be very even-handed, although not everybody will agree with that opinion simply because not everybody is prepared to be so fair and reasonable with Contractors. For the sake of those contrary minded, a word of warning: the more risks and responsibilities placed on the Contractor's shoulders, the more likely the chance of lengthy and expensive disputes, notwithstanding Partnering or the introduction of ADR.

Admittedly, it is premature to speculate about the acceptance of the ideas advocated by the NEC, particularly on the North American continent. Nevertheless it is safe to predict that they will have a significant impact on future contracting the world over, either in its current format or with subsequent revisions. It is clear, for instance, that for it to be generally adopted in the USA or in Canada some of its language would have to be altered to bring it more in line with local usage and existing statutes. It is also possible that the Professional Acts of some states or provinces may have to be revised to allow an Employer to appoint a non-engineer/architect as Project Manager, unless of course the presence of a professional Supervisor could solve that problem.

One may also ask whether replacing one individual (i.e. the engineer/architect) with two (i.e. the Project Manager and the Supervisor) would not unnecessarily increase the cost of construction, particularly on smaller projects. Although the NEC does not deal with this issue, it is contended that neither the Project Manager nor the Supervisor would have to be on the project full time in the same way as the engineer/architect is today. All these uncertainties and/or problems, however, would pale into insignificance if the innovations introduced by the NEC would actually help to reduce disputes and enhance the cost effectiveness of construction, as it is believed they can.

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