

Journal of the Association of Engineers

VOL. XXVIII

APRIL—JUNE & JULY—SEPT.,

No. 2 & 3

THE EDITORIAL NOTES

Engineering Contracts, Consulting Engineers & Government Departments

A reprehensible practice among Consulting Engineers that leads to much delay and increased cost in the execution of our Engineering Projects needs to be brought to light and opposed vigorously :-- It is the practice of evading their own responsibility by throwing on the contractors the onus of carrying out works and supplying items which the consulting engineers themselves had failed to include in their specifications : specifications which they had been called upon to prepare in the belief that they possessed the expert knowledge that their clients lacked.

When a Government Department has a simple project to execute it prepares its own plans and specifications in broad outline for inviting competitive tenders ; but for complicated projects the Government usually appoints foreign consulting engineering firms or invites the foreign experts to prepare plans, estimates and specifications or to give advice on certain particular aspects of the projects. Similarly the Provincial governments, Port Trusts, Corporations, big Industrial Concerns etc., engage a foreign Consulting Engineers for their projects. It is the standard and usual practice to send preliminary data required for the preparation of the scheme to the headquarters of the firm. In case of doubts, the firm arranges for one of its senior members to visit the site followed by more visits if

need be. There is also correspondence calling for explanations and additional information, thus causing delay. Sometimes model experiments are proposed and carried out in the foreign universities by these firms at the cost of the government, and with no benefit to the Indian engineers. From data thus collected, the consulting engineering firm prepares plans, specifications and a rough bill of quantities. Some times Indian Engineers are sent abroad to work in these firms in the preliminary stage.

Then either the Government or the Consulting Engineering firms invite tenders or request a few selected engineering firms to submit quotations. Usually in such tender documents, the following ambiguous clauses or similar ones are inserted throwing the full responsibility for their offers on the Contracting firms :

- (a) "Contractor is not bound to these details but sections etc. used in the work shall not be less in cross-sectional area than those indicated on the Contract drawings. The fact that sections have been given on the drawings, shall not relieve the contractor of his responsibility."
- (b) "In cases where estimated quantities are given with the schedule, it must be understood that neither the client nor any one on their behalf will be responsible for their accuracy and if the contractor makes use of these in preparing his tender, he does so on his own risk."
- (c) "No claim of any kind in respect of the Contract price and time of delivery on the ground of incompleteness or inaccuracies in the Contract drawings will be admitted."

If any project is properly planned in detail with guaranteed bills of quantities which need no major modification during the execution, it can be easily carried out departmentally and young engineers fresh from Universities can be put in charge of such projects as is done in Brazil. The following extract from "Times of India" makes interesting reading and may be a lesson to our Government.

"In Brazil a major hydro-electric project with an eventual capacity of 90,000 Kilowatts is being constructed by young men fresh from Universities and many of whom are in their twenties. The average age of the engineers in charge of the scheme is 30."

If this suggestion of entrusting the execution of a project, such as a hydro-electric project, to young intelligent engineering graduates is adopted, it is certain, not only that these young engineers shall satisfactorily execute the project with speed but also that they will gain sound experience and self confidence due to the responsibilities entrusted to them, which will be of great benefit to our country. And incidentally there will be a reduction in cost of the project. Will the Government take such a risk ?

Our Engineering Projects cost too much and take too long a time to execute. This is mainly due to the present methods of preparing plans and estimates and inviting tenders for execution of projects and want of planning in the execution.

It is high time that Government issues instructions and circulars to all departments that replies to letters should be despatched within a week after their receipt. The delay in replying to letters is one of the causes of delay in execution of work. The greater the delay, the costlier is the job.

Similarly payment for the work done within a month will be very much appreciated by the engineering firms and this will reduce unnecessary correspondence and also will definitely help to decrease the cost of the project to a great extent.

It can be admitted without hesitation that the present estimating methods, system of inviting tenders, method of payment etc. are far below the standard of efficiency and accuracy. In the interest of the country, careful investigation should be made and the initial steps should be taken towards the needed reform. The Government might make a complete survey of the present estimating procedure throughout the country.

At present any lowering of the costs would be welcome and the Government will be doing a great service by making a start in this direction which will certainly help to reduce the cost of the various projects contemplated by the Government.

Some times open tenders for the construction of road bridges, workshops, transmission towers etc. are invited for competitive bids. In such tenders only broad outlines of the projects are given and the contractors are requested to submit their quotations for supply,

delivery and erection, with detailed designs calculations and drawings; and the specification and working stresses etc. are left to the discretion of the individual contractor.

In preparing such estimates for pricing from insufficient data, the contractors have to spend most of their time on the design and preparation of bills of quantities. Each of the competing general contractors take off quantities of the work his firm intends to execute by itself if awarded the contract. In the same way Sub-Contractors take off their own quantities of work when the main contractors solicit bids on special items which they cannot execute.

Thus quantities and design of same items may be done many more times by different engineering firms between the preliminary estimates and the final completion of the project. Think what an enormous amount of energy is being thus wasted. Similarly different designs are prepared by competing firms with different specifications and working stresses for the same project. This results in a long and laborious task for the department concerned in tabulating the tendered prices, with merits and demerits of each proposal, before awarding the contracts.

Therefore it is evident that this expensive method of inviting tenders without full and final information and without exact bill of quantities is one of the main factors contributing to the high cost of estimates and delay in execution of the work. Other factors are discrepancies, errors and omission of important details on the contract drawings and ambiguities in the specifications.

During the preparation of estimates, when any explanation is required on any doubtful point, it takes a very long time to get a reply from authorities concerned. This delay not only causes annoyance to the contractors but leaves very little time to prepare an economic estimate.

Even during the execution of work, delay in approval of working drawings or in replies to letters not only retards the progress of work but also increases correspondence by way of reminders. Without doubt all these tend to increase the cost of future estimates and contracts.

Delay in payment to the contractors for the work done even after a thorough examination of books by the government is another factor which contributes to the increase in cost of any project.

The delay is also due to getting decisions on changes in design, terms of contract etc. which are partly due to the men-in-charge of projects being not authorised to make such decisions and having to obtain sanction from higher or other authorities with concurrence of financial sanction from Secretarial officers having little or no technical knowledge. All such delays in progress of work cause idle time among staff and labour of the contractors who naturally have to make up for these expenses in other contracts unless they have made liberal allowances for such contingencies.

The cancellation of the contracts already in progress not only causes annoyance to the contractors but upsets the planning of the other contracts in hand.

To remedy these defects an outline of the plan of inviting bids and execution of work is given below.

When a foreign consulting engineering firm is entrusted with the preparation of any project, this firm should be requested to open an office near the headquarters of the department concerned or to appoint an agent authorised to settle all doubtful points promptly without references to his principals.

The plans, drawings and specification should be prepared accurately and without any ambiguities after a thorough examination of site conditions and a study of all the relative aspects of the projects. In order to avoid any modification of the scheme during execution of the work, a programme of the construction should be prepared before hand to ensure that when the contract is awarded the work can be commenced and pushed through with full speed without setback.

The bill of quantities for materials should be prepared accurately and should be such that it can be directly priced and the same should be given to the tenderers along with the specification with the tender forms.

It is well known that there is only one correct bill of quantities for any particular design of a project. The exact amount of materials required in the project should be estimated accurately from the plans and specifications if they are adequately prepared and checked thoroughly. The bill of quantities thus produced can be used to

serve all requirements for the duration of the contract i.e., from the ordering of materials, scheduling of the work and finally for payment to the contractors.

The main idea is that the exact amount of materials in all respects should be guaranteed to the engineering firms tendering for the job. This can be achieved safely if the Consulting Engineering Firms or Engineers responsible for the design of the project spend a little more of their time in preparing such bills of quantities. No doubt this can only be done if they are thoroughly trained and experienced and if they employ a careful system of checking. All variables such as waste of materials and the requisite equipment and construction plants to execute the work should be left to the judgement of the contractors tendering for the work. What material is actually required for the completed project should only be included in the bill of quantities.

Thus everyone in the construction industry is benefited from a guaranteed quantity accompanied by detailed plans. In effect, all competing contractors will be pricing on the same quantities rather than on their own version of what the job contains.

Therefore either Government departments or the Consulting Engineering firms will have to prepare plans, specifications, and guaranteed bills of quantities which are thoroughly checked and corrected before they are issued for tendering. This will also eliminate much of the complicated routine which we meet with now-a-days and it will dispense with most of the extras and useless work.
