

consultant may have a preference for a specific type of contract. If the consultant can demonstrate that his proposed type of contract is beneficial (or at least not disadvantageous) to the sponsor, due consideration should be given to adopting that type of contract.

4.3 SALARY COST TIMES A MULTIPLIER PLUS DIRECT NON-SALARY EXPENSE

4.3.1 For many projects it is not possible to state accurately the scope of work at the time the consultant is retained for the project. The preliminary engineering services, such as surveys, investigations, preparation of budget estimates, process studies, development of alternate layout plans, and other services needed to establish the final design, are usually so indeterminate in scope that neither a lump sum nor a fixed percentage of construction cost would be an equitable basis of compensation. Furthermore, on many projects, during the design phase, it becomes necessary to undertake additional investigative work, the results of which may further alter the scope of the project. Compensation for services on the basis of the salary cost of the work, times an agreed multiplier is a satisfactory and equitable method for such assignments, when the effort required is unduly difficult to predetermine. Direct non-salary expenses are ordinarily considered as a separate item for reimbursement.

4.3.2 The multiplier which is applied to salary cost is a factor which compensates the consultant for overhead, (see 4.3.4), plus a reasonable margin for profit. The size of the multiplier will vary with the type of work, the organization and experience of the consultant, and the geographic area in which the office is located. Salaries or imputed salaries of partners or principals, to the extent that they perform technical or advisory services directly applicable to the project, are considered as salary cost. Since, on this basis of payment, the salaries are the most important element of cost, it is advisable for the sponsor to reach an agreement with the consultant on the salary ranges for each classification of labour chargeable. In so doing he minimizes the possibility of disputes during audits of the consultant's accounts.

4.3.3 Direct non-salary expenses usually incurred in such engagements may include the following:

- a) *living and travelling expenses of employees, partners, and principals when away from the home office on business connected with the project;*
- b) *identifiable communication expense, such as long-distance telephone, telegraph, cable express charges, and postage, other than for general correspondence;*
- c) *services directly applicable to the work, such as special legal and accounting expenses, computer rental and programming costs, special consultants, borings, laboratory charges, commercial printing and binding, and similar costs that are not applicable to general overhead;*
- d) *identifiable drafting supplies and expenses charged to the client's work, as distinguished from such supplies and expenses applicable to two or more projects; and*

- e) *identifiable reproduction costs applicable to the work, such as blue-printing, photostating, mimeographing, printing, etc.*

These expenses, which seldom can be determined in advance with any degree of accuracy, are reimbursed by the client at actual invoice cost.

4.3.4 The consultant's overhead, which comprises a major portion of the compensation generated by the multiplier on salary cost, includes the following "indirect" costs, which are not directly allocable to specific engagements:

- a) *provisions for office, light, heat, and similar items for working space, depreciation allowances or rental for furniture, drafting equipment and engineering instruments, automobile expenses, and office and drafting supplies not identifiable to specific projects;*
- b) *insurance and taxes (other than income tax);*
- c) *library and periodical expenses, and other means of keeping abreast of advances in engineering, such as attendance at technical and professional meetings;*
- d) *executive, administrative, accounting, legal, stenographic, and clerical salaries and expenses, other than identifiable salaries included in salary costs and expenses included in reimburseable non-salary expenses, plus salaries or imputed salaries of partners and principals, to the extent that they perform general executive and administrative services as distinguished from technical or advisory services directly applicable to particular projects. These services and expenses, essential to the conduct of the business, include preliminary arrangements for new projects or assignments, and interest on borrowed capital;*
- e) *business development expenses, including salaries of principals and salary costs of employees so engaged; and*
- f) *provision for loss of productive time of technical employees between assignments, and for time of principals and employees on public interest assignments.*

4.4 COST PLUS A FIXED PAYMENT

4.4.1 For many engineering projects, the consultant is required to start work before the cost and detailed scope of the project can be accurately determined. Such indeterminate projects generally result from requirements for speed, special problems which require studies, research or experimental work, preparation of estimates for alternate types of construction, and other requirements. The contract, however, should carry a reasonably well developed description or statement of the scope of work contemplated - that is, the number, size and character of buildings or other facilities, the extent of utilities and other items.

4.4.2 For this type of project, the cost-plus-fixed-payment method offers a satisfactory basis for performing the service. Under the cost-plus-fixed-payment contracts, the consultant is reimbursed for the actual costs of all his services and supplies including the following:

- a) Salary cost. As previously defined.
- b) Overhead. As previously defined. The consultant should be prepared to support the bases for his overhead charges.
- c) Direct non-salary expenses. As previously defined.
- d) Fixed payment. In addition to reimbursement for costs included in a), b) and c) above, the consultant is paid a fixed amount for profit. The fixed payment varies with the scope of the engineering services involved. This may be an amount based on the estimated cost of the project at the time the consultant is engaged. The cost-plus-a-fixed-payment basis of compensation requires, as a prerequisite to equitable negotiation, that the scope of the project itself be fairly well defined, and that the services to be performed by the consultant be fully set forth in the agreement. Such agreements should also provide for appropriate adjustments in the fixed payment, in the event that the physical scope of the project, time for completion, or the services required are materially increased over that contemplated during the negotiations.

4.5 FIXED LUMP-SUM PAYMENT

4.5.1 This method of compensating consultants is used frequently for investigations and studies and for basic services on design-type projects when the scope of the assignments to be undertaken can be clearly and fully defined.

4.5.2 Two methods are generally used to arrive at a lump-sum compensation for the basic services on design-type projects. The first of these is the computation of a lump sum as an appropriate percentage of the estimated construction cost of the project. The second is direct development of a fixed amount of compensation, by estimating the individual elements of the design outlined in the foregoing section, plus a reasonable margin of profit, all expressed as a single lump sum. These two methods are frequently used concurrently, each as a check on the other. For arriving at a lump-sum compensation for investigations and studies, the second of the two preceding methods is generally used.

4.5.3 Where consultation is undertaken on a lump-sum basis, the agreement should designate a calendar limit within which the services are to be performed, and a provision for additional compensation for time in excess of that stated, provided that the extension of time is not due to delays on the part of the consultant. In design assignments, there should be a provision for compensation for changes required after the approval of preliminary designs.

4.5.4 When the lump-sum payment method is used it should be broken down into logical sub-parts to facilitate negotiations and progress payments.

4.6 PERCENTAGE OF CONSTRUCTION COST

4.6.1 This method has been widely used for determining the compensation of consulting engineers on assignments where the principal responsibility is the design of various works, and the preparation of drawings, specifications, and other contract documents necessary for the description of facilities to be constructed. Construction cost is defined as the total cost to the client for the execution of the work authorized at one time and handled in each separate phase of consultant services, excluding fees or other costs for legal services, the cost of land, rights-of-way, legal and administrative expenses, but including the direct cost to the client of all construction contracts; items of construction, including labour, materials, and equipment required for the completed work (including extras) and equipment purchased or furnished directly by the client for the project.

4.6.2 Over the years, engineering experience has established some approximate correlations between engineering costs and construction costs, for certain types of engineering design, where design procedures and materials or construction are more or less standardized. These correlations have resulted in various curves and schedules which have been widely used - so much so that they are sometimes mistakenly regarded as fixed basis of compensation for design projects of any kind. Two of the curves in common usage are included in Figures 2-1 and 2-2.

4.6.3 The validity of the percentage-of-construction-cost method rests upon the assumption that engineering costs vary in proportion to the cost of construction, irrespective of the location or type of construction undertaken. This is a questionable assumption, however, it is not intended to imply that these assumed relationships between engineering costs and construction costs are no longer of value. When judiciously applied, and with due consideration of the ranges within which engineering scope may vary, they remain valuable as tools for general comparison with lump-sum or salary-plus-multiplier charges for design services. Their acceptance over many years also affords a valuable guide for judging the reasonableness of proposals for engineering services.

4.7 CONTRACT FORMAT AND PROVISIONS

4.7.1 The relations of the consultant with the sponsor should be clearly defined by a written agreement before commencement of actual work. All of the terms should be clearly defined in the agreement. It should state the parties to the contract and define the complete extent and character of the work to be performed as well as conditions relating to any time limitations which may be involved. The terms and payments for various services should follow. The scope of the consultant effort should be described in complete detail to determine whether some services will need to be otherwise contracted for or be provided by the sponsor.

4.7.2 Consultant contracts usually cover highly technical services. Therefore, to ensure the soundness of a legal document, it is essential that someone who has thorough knowledge of the project prepare the sections describing services to be performed, sequence of work, information to be furnished by the sponsor, and terms of payment.

4.7.3 Many government agencies, business firms, and engineering organizations have developed standardized forms for engineering and planning contracts. However, it is generally necessary to modify these standard agreements to reflect the specific terms and conditions applicable to a particular project. These modifications should be carefully examined for compliance with applicable law.

4.7.4 The contract between the sponsor and the consultant should establish the scope of work based on carrying out his professional duties under the requirements of law. The contract should, therefore, be explicit as to the laws which will govern the contract and any disputes arising therefrom.

4.7.5 It is common under a contract for one firm to provide the basic services and one or more others to provide special services as sub-contractors to the main firm. In these cases, the firm providing the basic consultant services is considered the principal consultant who co-ordinates and oversees the work of these engineering/ consultant firms and has the overall responsibility for the acceptability and quality of the work. It is, therefore, extremely important that the contract clearly specify the division of responsibility and authority between all parties engaged in carrying out elements of the project.

4.7.6 The final terms of the contract will probably not evolve until negotiations have been completed to the satisfaction of both parties to the contract. However, it is of extreme importance that a draft contract be prepared as a starting point for the negotiation.

4.7.7 The following checklist contains the more important items and provisions to be considered in preparing any contract for consultant services:

- a) *effective date of contract;*
- b) *names and descriptions of the parties to the agreement with their addresses and, in the case of a corporate body, the legal description of the corporation;*
- c) *nature, extent, and character of the project, the location thereof, and the time limitations;*
- d) *services, including performance and delivery schedules, to be rendered by the consultant;*
- e) *delineation of responsibilities of the consultant, the sponsor, and other consultants and parties involved in the performance of the project;*

- f) provision for renegotiation of the contract on the basis of change in the scope of the project, changes in conditions, additional work, etc.;
- g) provision for ownership of original documents such as tracings, plans, specifications, maps, basic survey notes and sketches, charts, computations, and other data prepared or obtained under the terms of the contract;
- h) provision that reproducible copies of planning and design drawings and specifications be made available to the sponsor upon request;
- i) compensation, including methods of payment and payment schedules, for services to be rendered by consultants; and
- j) provision for the equitable termination of the consultant services should the situation arise wherein such termination is dictated by circumstances.

4.8 STANDARD PROVISIONS

4.8.1 Standard contract provisions have been taken from International General Rules of Agreement (Part 1 - Standard Conditions) produced and issued by the Federation of Consulting Engineers and are included in the appendix. The provisions have been re-numbered for clarity. Some of the provisions contain references to appendices to the International General Rules of Agreement which have not been included in this manual. The references have not been deleted since they demonstrate the requirement for provisions specific to each project.

4.8.2 In the preparation of the International General Rules it was recognized that while there were numerous clauses which would be universally applicable, there were some clauses which must necessarily vary to take account of the circumstances and locality in which the services would be carried out. The clauses of universal application have been grouped together and are referred to as General Provisions (Standard Provisions).

4.8.3 The project sponsor, however, should examine these Standard Provisions to assure himself that there is no conflict with the laws or standard practices in his State, before using them in any proposed contract.

CHAPTER 5.- AWARD OF CONTRACT

5.1 INTRODUCTION

5.1.1 The award of contract depends on the successful completion of negotiation of the scope of work, the contract terms, and the fee. Further, it depends on incorporating accurately all the agreements reached during negotiations into a final version of the contract which is satisfactory to the sponsor, the consultant, and the legally authorized governmental departments and lending agencies. The contract is not legally binding on either party until all the necessary signatures are affixed, and all necessary guarantees are issued.

5.1.2 This process can in some cases consume considerable time. If there is an urgency about starting the work, a letter of intent to enter into a contract can be written (provided there is agreement between the sponsor and the consultant) which is an expression of good faith allowing a limited start on the work.

5.2 NEGOTIATION OBJECTIVES

5.2.1 The objective of the negotiations is to establish, without ambiguity:

- a) *the scope of work;*
- b) *the conditions under which it is to be accomplished;*
- c) *the time frame for completion of the whole work and its component parts;*
- d) *the fee to be paid; and*
- e) *the manner and timing of payment.*

All these considerations must be agreed to the mutual satisfaction of the parties and within the parties' true desire and ability to live up to the agreements. This is generally achieved through acceptable compromise. Acceptable compromise does not imply reaching an agreement exactly half-way between the original positions of the parties. The agreement reached should be fair to both parties, it should not be the objective for one party to gain some advantage over the other. In this context, each party should make known to the other any factors of which he is aware, either project related or apart from the project, which could affect the progress of the work.

5.2.2 Regardless of how well the terms of reference and scope of work have been prepared in the request for proposals, there will be questions in the minds of the respondents that can only be answered in face-to-face meetings. Each consultant will have questions that arise from his experiences on similar projects for other clients and not all of these questions can be answered and accommodated in the time usually devoted to proposal preparation. Similarly, regardless of how well the proposal has been prepared, there will be questions in the mind of the sponsor as to the consultant's

degree of full understanding of and conformity to the terms of reference. It is helpful, therefore, to arrange for pre-negotiation meetings during which these questions can be raised and answered to achieve an understanding by each party of the assumptions made by the other and the basic positions and logic which evolved on the basis of those assumptions. It would be helpful at this time, for the sponsor to furnish the consultant with sample contracts from previous projects and a draft of the contract proposed for negotiation.

5.2.3 The scope of work is generally the first item to be taken up in the negotiations since all other factors must be agreed upon on the basis of the scope of work. When the project is complex, it is often difficult, if not impossible, to define the scope of work in formal contract language. The negotiation process provides a means for both parties to reach agreement on the intent of the written scope of work.

5.2.4 The second item to be negotiated is the cost of performing the work. In preparing the detailed estimate of manpower requirements for each element of the work, the consultant may have used subdivisions of the project which are different than the sponsor has used in his analysis. In such cases, an item by item comparison will not be feasible and comparison of groups of individual items will need to be used.

5.2.5 The third item to be negotiated is the terms of reference. Certain of these terms will, of course, be non-negotiable because they are dictated by authorities over which neither party has control. The non-negotiable terms should be stated at the outset of this phase of the negotiations, leaving the rest to be negotiated in the best interest of both parties.

5.3 VERIFICATION OF PROPOSALS

5.3.1 When agreement has been reached on the contract scope of work, if there are any changes to the scope considered in the proposal, the consultant should be asked to submit a revised fee proposal with supporting cost breakdown. The consultant should prepare a detailed estimate of the hours and cost required for each of the major tasks. In addition to charges for labor, the consultant should, if appropriate, indicate the costs for subconsultants, travel, living expenses, reproduction, and other direct out-of-pocket expenses expected to be incurred.

5.3.2 A sponsor having a staff with experience in estimating the cost of professional services and negotiating contracts for these services should develop an independent estimate of the cost of the services based on a detailed analysis of the scope and conditions of the work before negotiations begin. Sponsors having no staff or having little or no previous experience in estimating the cost of professional services and negotiating contracts for consultant services may not be able to prepare such a detailed analysis by themselves. In these instances, the sponsor should seek the advice of ICAO or other competent organizations on the extent and scope of the professional services for similar types of projects. If the sponsor has an engineer on retainer that is not being considered for the project, the sponsor may engage that engineer to prepare a detailed analysis. The importance of having a detailed analysis prior to entering negotiations cannot be overemphasized. Without such an analysis, the sponsor does not have a benchmark for negotiations.

5.3.3 Fee negotiations should be based upon the cost or pricing data submitted by the consultant and an evaluation of the specific work efforts required for each task. The data should be subject to a technical/engineering cost analysis by the sponsor. Significant differences between the estimates submitted by the consultant and the estimates developed by the sponsor should be resolved, and revisions should be made to the estimates and/or fee as required.

5.3.4 If the contract is to be awarded in its entirety or in part on a cost reimbursable basis, the components of the reimbursable costs must be established (see 4.3) and agreed to in the negotiations. The consultant should be required to present and justify the documentation establishing those costs. Procedures for auditing the consultant's costs relative to the project should be established.

5.4 DETERMINATION OF POSSIBLE SCOPE AND/OR SCHEDULE CHANGES

5.4.1 There are a number of circumstances which may arise during the negotiations that indicate the advisability of changing either the scope of work, the schedule or both. This should also result in a change to the fee proposal which was based on the original scope of work and schedule. Any increase or decrease to the scope or schedule of each contract must be examined within the context of its effect on the project as a whole since other contracts would probably also require modification to accommodate the changes made to the contract under negotiation.

5.4.2 Some examples of circumstances which might lead to a change in schedule are:

- a) *the ability and willingness of the consultant to offer more favourable terms for such a change;*
- b) *the availability to the project of certain preferred experienced staff members in a different time frame;*
- c) *a reduction or increase in the scope of work; and*
- d) *the methodology proposed by the consultant.*

5.4.3 Some examples of circumstances which might lead to a change in scope of work are:

- a) *the lack of sufficient experience by the consultant (and his subconsultants) in a certain specialized element of the original scope of work;*
- b) *inability to reach agreement on the manpower/cost of accomplishing one or more specific tasks set forth in the original scope of work, provided that agreement can be reached on all other tasks; and*

- c) *a determination that additions to the scope of work would be accomplished beneficially by the same consultant in parallel with the original tasks.*

5.4.4 The sponsor should also consider any changes in the terms of reference proposed by the consultant that appear financially or otherwise beneficial to the sponsor and/or the conduct of the work. Some examples of such possible changes are:

- a) *location of the work force;*
- b) *composition of the work force; and*
- c) *type of contract (fee basis).*

5.5 NEGOTIATION PROCESS

5.5.1 Negotiation is a formal process. However, it should be undertaken in an atmosphere of cordiality, mutual trust and co-operation. The assumption of an adversary role by any of the participants can result in causing feelings of antagonism that may continue through the life of the project.

5.5.2 Each party to the negotiations should enter into them with a pre-prepared position and the documentation required to support that position. These positions will have been prepared on certain assumptions and on the previous experience of the consultant. These assumptions and the experience gained on previous projects might well be substantially different for each party to the negotiations.

5.5.3 Each party should grant to the other the opportunity to explain the logic of his assumptions and the background of experience on which they were made. In every case where a decision must be made, either the selection of one position as opposed to the other or a compromise position, the prime consideration should always be the net effect on the project and the conduct of the work.

5.5.4 Unless the project is of such magnitude and complexity that the negotiations are subdivided into subjects to be taken up by two or more "committees", the subjects for negotiation should be addressed one at a time and, once agreement is reached, should not be reopened except when that agreement is substantially affected by the negotiation on a subsequent and related subject.

5.6 PARTICIPANTS

5.6.1 Participation in the negotiations should be confined to the minimum of people essential for the process. However, the participants should be able to call on experts in all fields (technical, legal, financial) to enter into the negotiations if needed for the limited periods of time during which the subject of their expertise is being discussed.