

AIRPORT PLANNING MANUAL



PART 3

GUIDELINES FOR CONSULTANT/CONSTRUCTION SERVICES

FIRST EDITION — 1983

*Approved by the Secretary General
and published under his authority*

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Airport Planning Manual

(Doc 9184-AN/902)

Part 3

Guidelines for Consultant/Construction Services

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AMENDMENTS

Amendments are announced in the supplements to the *Catalogue of ICAO Publications*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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FOREWORD

This manual provides a general overview on contracting for planning or construction services. It is intended for both persons who are directly involved in the preparation and administration of a contract as well as supervisors of such persons.

Primarily, the manual is aimed at contracts related to airport development but it may be of benefit to many other contract applications. Its purpose is to outline the various steps that should be taken from conception of the idea to contract for services to completion of the contract. It is not intended to be a textbook on contracting but rather to identify the various stages and important issues associated with each stage.

In this regard the manual has purposely been kept concise. Specific examples are included but the reader is cautioned that the circumstances surrounding each contract are different and all advice in this manual must be judged accordingly and in relation to the work to be accomplished.

This first edition of the manual was prepared by the Air Navigation Bureau, with the assistance of an expert technical consultant.

It is intended that the manual be kept up to date. Future editions will be improved on the basis of experience gained and comments and suggestions received from users of this manual. Therefore, readers of the manual are invited to give their views, comments and suggestions on this edition. These should be directed to the Secretary General of ICAO.

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CHAPTER 1.- INTRODUCTION

1.1 PURPOSE OF MANUAL

1.1.1 This manual is intended to provide information and guidance to those individuals and authorities responsible for the planning, design and construction of airports and airport facilities. This information and guidance is specifically related to the processes for selection of international consultants and contractors and the preparation, negotiation and administration of contracts for the work which they have been retained to perform.

1.1.2 There are considerable differences between the organization, the processes and frequently the legal requirements of contracting for consulting services vis-a-vis contracting for construction services. The two are, therefore, dealt with separately in this manual, Chapters 1 through 6 of the text being devoted to consulting services and Chapter 7 to construction contracts.

1.1.3 While the manual is primarily directed toward projects for which the sponsor chooses or is required to solicit proposals from consultants and/or contractors by international invitation, much of the content is equally applicable to projects executed with the help of local consultants/contractors. However, it is not the purpose or intent of this manual to influence the established regulations or procedures employed by each State in contracting services for projects to be planned, designed and constructed by local consultants and contractors.

1.1.4 In some States, the responsibility for construction rests with ministries or agencies separate from those responsible for planning and design; in other States, the process is continuous within one ministry or agency from project inception to completion. In either case, it is desirable to have continuity through the project. Therefore, guidance material is also included in this manual for retaining consultants for post-design services.

1.1.5 One consideration remains paramount in any case. Regardless of the type of contract under which a consultant is retained to perform one or more specific task, and regardless of how well that contract is administered, the quality and cost of the completed work depends on the competence and integrity of the consultant. Thus, the selection of the proper consultant for planning, design and post-design services is one of the most significant steps in the realization of a project, ranking in importance equal to the selection of the contractor for construction.

1.2 SCOPE AND USAGE OF MANUAL

1.2.1 The manual has been prepared to provide guidance for those projects requiring the full range of consulting services from initial planning to placing the facility in service. The suggestions and the logic on which they are based are subject to common sense analysis and adaptation for those projects for which the full range of services are not required. Other than discussion on the possible limitations which might be imposed by lending agencies, this manual does not address the subject of financing the project.

1.2.2 The manual discusses the procedures for each phase of project realization with regard to:

- a) *solicitation of consultants;*
- b) *selection of consultant;*
- c) *negotiations with consultant;*
- d) *award of contract; and*
- e) *administration of contract.*

1.2.3 The phases of project realization considered in this manual are those in which the consultant might participate:

- a) *pre-planning (investigations and forecasts);*
- b) *planning;*
- c) *preliminary and final design;*
- d) *construction (post design services); and*
- e) *placing into operation.*

1.2.4 The starting point for any project is the identification of an apparent need or demand. Satisfaction of this need or demand can, in some cases, be accomplished by expansion or modification of an existing facility; in other cases a new and separate facility might be required. Having identified the need or demand, the next step (pre-planning) is to forecast its potential growth and to develop the programmes for the facilities which will be required to satisfy that demand. Simultaneously, site selection studies and all investigations required to establish the parameters for design and construction should be undertaken.

1.2.5 The second phase (planning) starts with the development of alternative schemes for the selected site, evaluation of those schemes and the preparation of sufficient documentation (sketches, cost estimates, revenue projections) to determine financial feasibility and to form a solid basis for continuing the work. The planning phase culminates in the preparation of a comprehensive master plan which establishes the basic framework for ultimate development, the general locations, approximate sizes and basis of design for all facilities. It also establishes the extent of the initial construction and the steps by which expansion would take place to keep pace with demand.

1.2.6 The third phase of consultant effort is the design, preliminary and final. A co-ordinated preliminary design, supplemented by outline specifications and preliminary cost estimates, should be undertaken for each major physical element of the project. Detailed plans, specifications, cost estimates, bidding schedules and all other contract documents are completed in the final design phase. For airport projects the major design elements include:

- a) *runways and taxiways;*
- b) *the passenger terminal area and buildings;*

- c) *the support and ancillary areas and buildings;*
- d) *the infrastructure (roads and utility systems);*
- e) *automobile parking; and*
- f) *special systems (navigational aids, control tower, movement area lighting, aircraft fuelling, other fixed apron services).*

1.2.7 The fourth phase (post-design services) follows completion of the final design and contract documents and continues through the actual construction and placing the facility into operation. The consultant's role in this phase can have significant variation in form and magnitude. It is primarily dependent on the type and number of construction contracts, and the degree to which the sponsor or other responsible agencies assume those functions themselves. A range of possible functions is described in 2.2.11.

1.3 SIZES AND TYPES OF PROJECTS

1.3.1 The procedures described in this manual entail a considerable expenditure of time and effort on the part of the project sponsor. It follows then that it is principally applicable to large, comprehensive, complex projects. However, it is also useful as a guideline for smaller, less comprehensive projects.

1.3.2 Each consultant receiving a request for proposals will determine his willingness to respond on the basis of the effort required to prepare the proposal in accordance with the terms of reference weighed against the potential profitability of the work and his estimate of the probability of his being selected for the work. It follows then, that widely disseminated requests for proposals containing highly detailed and demanding terms of reference are counterproductive unless the project is very large and complex. For smaller projects, the sponsor is, therefore, advised to examine the suggested procedures with the aim of eliminating or reducing the required effort (both on the part of the sponsor and consultants) in research and preparation of requests for proposals and their responses, commensurate, of course, with the true needs of the project.

1.3.3 Consultants for participation in "turnkey" projects, projects for which the construction contractor is responsible for both design and construction, usually provide their services under sub-contract arrangements directly with the construction contractor. Thus all the normal procedures for soliciting and selecting consultants, and awarding and administering their contracts do not fully apply in those cases. The procedures for these functions as related to construction contracts are discussed in Chapter 7.

1.3.4 The successful completion of any project is dependent on the competency with which both the design and construction are carried out, both functions being equally important. Therefore, in the solicitation and selection of a construction contractor for "turnkey" projects, as much emphasis should be placed on the qualifications of the consultant he proposes as a sub-contractor as on the record of the construction company

itself. The discussion in Chapter 3 regarding the analysis of consultant's qualifications is, therefore, applicable to "turnkey" projects.

1.3.5 "Fast-track" projects, projects in which the construction starts before design is complete, should never be undertaken unless there is a clearly demonstrable urgency which cannot be satisfied by the normal progression of design followed by construction. "Fast-track" projects are particularly demanding of outstanding qualifications on the part of the consultant and contractor. To ensure continuous construction the design must constantly anticipate the progress of the work. The consultant must be prepared to furnish, on short notice, detailed drawings and specifications to meet any changes in the scheduling of the project. This requires a consultant with a highly flexible and highly competent staff with proven ability to work under pressure. Therefore, much greater emphasis should be placed on these factors both in the solicitation and selection of consultants than would be on ordinary projects.

1.4 STEP-BY-STEP PROCEDURE VS. COMBINING STEPS

1.4.1 There are three alternative basic procedures which can be followed in setting the scope of work of consultants' contracts.

- a) Step-by-step procedure. In this the contract covers one particular step of the work at a time, i.e., pre-planning, planning, design, post-design services, placing into service, for one or more (or all) elements of the project.
- b) Combining steps procedure. In this the contract combines all or some of these steps in the scope of work for one or more (or all) elements of the project.
- c) Hybrid procedure. Here the contract is explicit in the definition of the scope of work and other provisions for one or more of the earlier steps, and indicates the expectation and willingness of both parties to undertake negotiations for the continuation of the work when definition of that work becomes possible as a result of the on-going work under contract.

The advantages and disadvantages of each of these procedures, discussed below, do not address the subject of division of the work among several consultants. That subject is discussed in 2.2.

1.4.2 The principal advantages and disadvantages of awarding contracts on a step-by-step basis are:

- a) Advantages:
 - 1) should the consultant undertaking the work prove unsatisfactory to the sponsor, his contract can be cancelled with less penalty (and probably less loss of time) than would be the case for a larger scope contract; and

- 2) *the scope of work for each successive step could probably be defined more explicitly as the project progresses, thereby permitting a greater accuracy in determination of the reasonable fees.*

b) Disadvantages:

- 1) *the sponsor's effort in preparing, negotiating and administering contracts would be greater as a simple function of the greater number of contracts that would be involved; and*
- 2) *although the actual commitment of funds is spread out in time the total expenditure in funds will probably be greater. This is because consultants will have to protect against the possibility of incurring mobilization costs for each step (rather than one mobilization process for the whole project) and loss of productive time during the negotiations that would be necessary for each step.*

1.4.3 The principal advantages and disadvantages of combining project steps in one contract are, in general, a reversal of those that accrue to the step-by-step process. To these, however, should be added one very significant advantage. Combining project steps increases the scope and time frame of the work and enables the consultant to develop a long range staffing programme and, because the project will occupy a larger part of his overall workload, the incentive to provide his best managerial and technical staff.

1.4.4 The hybrid procedure described in alternative (c) can maximize the advantages and minimize the disadvantages previously described. Its applicability, and the advisability of employing it is greatly dependent on the degree of rapport and confidence that each party develops toward the other, and the maintenance of this rapport and confidence throughout the life of the project.

1.5 LIMITATIONS IMPOSED BY NATIONAL PRACTICE OR AGENCY STANDARDS

1.5.1 The conduct of every project must inevitably be influenced by national practices and in the case of agreements with foreign consultants or contractors, the project should be governed by international practice as well. Additionally, every public or quasi-public organization sponsoring a project must operate in conformity with the limitations imposed by its charter. Private organizations as well must operate within a set of rules or policies (written or established by past practice) by the top management of the organization. The project sponsor should be completely informed of those laws, regulations, and common practices as they affect the relationship between sponsor and consultant.

1.5.2 While it is unreasonable to expect that all these laws, regulations and common practices be included in the terms of reference for proposals, the sponsor should attempt to include those that are unique to his own State or in any other way could be considered unusual.

1.6 LIMITATIONS IMPOSED BY LENDING AGENCIES

1.6.1 There are numerous potential sources which make loans or grants for the accomplishment of certain projects. These sources are private, national, regional and international banks, governmental agencies, public and private institutions. Each lending agency has the responsibility to the sources of the money (depositors, governments, stockholders) to assure that the money is used for justifiable purposes and that there are suitable controls exercised in the expenditure of funds. While there is a diversity of policy among the lending agencies, each generally has a set of rules which must be followed with regard to solicitations of consultants and awarding and administering contracts in order to justify for the loan. The project sponsor should be familiar with these policies and adhere to them throughout the project to ensure continuity of financing.

1.6.2 Where possible, the names of the lending agency and the degree of authority and the rules of restrictions which will be imposed by that agency should be incorporated into the terms of reference for proposals.

1.7 PROJECT ORGANIZATION

1.7.1 The identification, preparation, initiation and co-ordination of large scale projects requires a broad range of technical and management capability, and, as the programme advances, a depth of these professional resources. Given current methodologies, requirements for budgeting, debt service assessment, and the criteria established by the major international lending institutions, project organization requires the highest level of attention on a continuous basis.

1.7.2 This requires a properly staffed organization with clear lines of responsibility and authority. The composition of this organization will be different if it is for one project rather than for a continuing role in many projects. If such an organization does not already exist, or is only partially formed, the project sponsor must give serious thought to creating, expanding or procuring such an organization.

1.7.3 Forming and staffing an organization to manage and accomplish all the necessary functions related to consultant and/or construction contracts can be very costly and difficult particularly on a one-project basis since:

- a) *recruitment of personnel for relatively short-term positions usually does not evoke applications from highly qualified people;*
- b) *the process of developing organization charts, detailing job functions and responsibilities, determining staffing requirements, delineating lines of communication and chain of command, and locating, planning and furnishing office space is a large undertaking per se; and*
- c) *there will be a period of time loss while the newly recruited staff familiarize themselves with the organization, their individual and collective job functions, and the*

project. This familiarization period almost always results in the need for re-evaluation and re-working of the organization charts as the true talents of the staff become apparent.

1.7.4 Because of the large scope and complexity of certain projects and the understandable pressure to achieve early results, the project sponsor often requires almost immediate expertise in several technical fields as well as competence in management. Hiring a consultant to provide the professional advisory services has gained wide acceptance as a responsive means to solve the problems that arise in these circumstances. Under the professional advisory services approach, the sponsor retains direct control, authority, approval and co-ordination on a day-by-day basis for all master planning and project implementation. The consultant acts in the role of technical adviser or "in-house" consultant. Based on work orders issued by the sponsor or as recommended by the consultant and approved by the sponsor, the advisory staff develops the projects for award to other consultants or agencies with whom the advisory staff will interface and/or monitor during the course of project execution.

1.7.5 Advisory services might include any or all of the following inter-related tasks:

- a) review and evaluation of the schedule for phased implementation of the overall programme;*
- b) review and evaluation of available or proposed plans for financing the programme;*
- c) review and evaluation of the findings of studies and investigations carried out to date. This helps in avoiding duplication and in properly assigning fields of responsibility and interest;*
- d) assistance in drafting specifications for, and in the procurement of equipment. This can help alleviate immediate needs;*
- e) identification of specific tasks and definition of project parameters such as objective, scope, cost, duration, final output, impact and feasibility. This will permit the sponsor to plan and commit the necessary funds for implementation;*
- f) preparation of project assessment papers for the procurement of financing. The consultant's familiarity with requirements of the international lending agencies can be brought to bear to help the sponsor in securing needed funds in a timely manner;*
- g) development of terms of reference for planning, design and construction contracts;*

- h) evaluation of technical proposals and presentation of recommendations for contract award;*
- i) assistance in contract negotiations with the successful firm or contractor; and*
- j) preparation of final contract documents for execution by the sponsor and the successful firm.*

1.7.6 As the project proceeds, additional tasks could be assigned, including:

- a) monitoring of contracts including review of project reports for completeness in comparison to scope of work, soundness of recommendations, and back-up supporting documentation;*
- b) development of management information systems to enable the sponsor to control and manage work in progress, properly phase the initiation of new contracts, and prepare budget estimates for the next fiscal year or ensuing years;*
- c) preparation of position papers on current and near completed contracts, particularly in cases where the client has to co-ordinate with other agencies;*
- d) development of other management information systems, or data banks;*
- e) planning, engineering and site supervision of specific project elements;*
- f) assistance and co-ordination with international lending agencies;*
- g) development of and assistance in training programmes for selected counterpart staff; and*
- h) preparation of progress reports or position papers on behalf of the sponsor for conference or public relations purposes.*

1.7.7 In regard to provision of services to the client for assistance with preparation of project applications for international financing, key members of the consultant staff should have had working experience with the international lending institutions. Each institution has its own requirements for the filing and processing of project applications. Their expeditious approval often depends largely on providing the appropriate papers and reports in proper sequence and in proper detail.

1.7.8 The advantages of the advisory services approach are:

- a) *there is no limit to the specific tasks that may be provided. This is to say that attention may be given to the development programme on many fronts simultaneously. Scopes of work for any number of contracts may be prepared and issued at short intervals while at the same time assessment papers are prepared for other elements of the work;*
- b) *it will permit an early attainment of impetus which can be maintained or increased as necessary. This aspect will permit recovery of any lost time or ensure adherence to project schedules as promulgated;*
- c) *the sponsor has complete control over the assignment of work tasks;*
- d) *it permits the development to proceed on many technical fronts with the advantage that the sponsor deals with only a single management entity;*
- e) *the sponsor increases his own project capability by the access to the technical staff resources of the consultant on very short notice; and*
- f) *in controlling the initiation of work tasks and staffing assignments - short and long term - the sponsor can pay for only the expertise provided by the easily-accountable "cost plus" reimbursement formula.*

1.7.9 The very important requirement of the sponsor, under the advisory services approach, is that the sponsor must assign full time a senior executive or advisory committee to whom the consultant can report on a day-to-day basis. Unless the advisory team can have such immediate access to a person or board with full authority to act, the advisory services approach can bog down and fail to realize its full potential.

CHAPTER 2.- TASK IDENTIFICATION

2.1 INTRODUCTION

2.1.1 Before any effort can be expended profitably in the process of retaining the services of a consultant, the project sponsor should have made sufficient determinations to ensure that:

- a) *there is a need for consultant services that cannot be satisfied from within the sponsor's organization because of a lack of expertise, insufficient manpower or insufficient time; and*
- b) *financing will be available for consultant services and preferably for the project itself.*

2.1.2 Having made those determinations, the sponsor should accomplish sufficient preparatory work to anticipate the problems that might delay or confuse the process of soliciting and employing a consultant. Stated simply, the sponsor must identify what must be accomplished, the time frame for its completion, and the budget available for the work.

2.1.3 The primary tool for task identification is the assembly and analysis of all pertinent information required for preparation of the terms of reference for the specific task(s). This includes not only the scope of work, but all factors affecting the conduct of the work and the consultant's fee.

2.1.4 Regardless of the degree to which this information is elaborated in the terms of reference, prospective consultants will have questions regarding it which may be raised at any point during the selection process. The sponsor must be able to provide a prompt answer to those questions to avoid delays. Information of a technical and statistical nature provided in response to questions often directly affects the consultant's estimate of manpower and work effort. The expressions of interest or proposals prepared by consultants in response to a solicitation, whether or not they include price offers, are inherently competitive. Therefore, any information furnished verbally or in writing to one consultant should be furnished to all.

2.2 MAGNITUDE OF TASK AND SCHEDULE

2.2.1 The magnitude and schedule for any task are inherently interdependent and are a function of the schedule and magnitude of the project as a whole. The project sponsor, therefore, should prepare a tentative overall planning, design and construction schedule for the project using the histories of similar projects as a bench mark. After an evaluation of the availability of the physical and financial resources to accomplish the work within the estimated time frame, more detailed breakdowns of the schedules should be made. When this has been accomplished, the process of identifying tasks or combinations of tasks for accomplishment by a consultant (or consultants) can proceed on a solid foundation.

2.2.2 It is highly desirable that only one consultant be engaged to accomplish all the basic planning tasks since proper planning requires the integration and co-ordination of all project elements, including timing and budgeting. This is very difficult to achieve when the responsibility is diffused. Also, a much larger and more difficult burden falls on the sponsor's organization to provide the co-ordination and administration of multiple contracts.

2.2.3 For certain projects, particularly those for which a decision to proceed is dependent on the result of the planning, it may be advisable for the sponsor to award an initial planning contract in as many as four phases:

- a) *forecasting and programming;*
- b) *investigations and site selection;*
- c) *preparation of alternative schemes and recommendations; and*
- d) *development of a master plan, cost estimates and a financial feasibility analysis.*

2.2.4 However, unless a decision to proceed with any phase of the planning is totally dependent on the results of the previous phase, it is in the sponsor's interest to award a comprehensive single phase contract. Many of the work elements of the planning process can be carried on simultaneously (or at least can overlap) creating a more efficient scheduling of the consultant's work and minimizing unproductive staff time. Assurance of work continuity results in lower costs to the sponsor.

2.2.5 If the contract must be awarded in such a form that the work is to proceed on a phase by phase basis, the line of demarcation between phases must be very clear and the review and approval of each phase must be accomplished in a very short time period to minimize the consultant's project-related costs between phases. This is best accomplished by permitting the consultant to proceed on those aspects of the subsequent phase where the activities involved are not affected by the conclusions of the preceding phase. It is also advisable that the phase reports should be reviewed at least in part concurrently with their preparation, thus shortening the time required for formal review. It is imperative, in any case, that review time be kept to a minimum or it will consume an inordinately large time period in the total project schedule.

2.2.6 The preliminary design phase has many of the same characteristics as the planning phase and it is, therefore, desirable to have it accomplished by a single consultant, preferably the consultant who has done the planning. The value of continuity and familiarity with the project background cannot be overemphasized. Should the consultant who accomplished the planning not be fully qualified to accomplish the preliminary design of every airport element with his own forces, the use of sub-consultants (whose qualifications are acceptable to the sponsor) is a standard practice and can be considered. The prime consultant must, however, bear responsibility for the quality of design and adherence to schedule of the sub-consultants. It is also acceptable to have the design accomplished by a legally constituted consortium of consultants as long as the party responsible for performance of the consortium is clearly identified.

2.2.7 The preliminary design phase establishes the approximate size and layout of the project. It includes carrying out surveys and investigations to supplement and refine those accomplished in the planning stage. The preliminary design involves the study of alternative means, systems, and materials for fulfilling the master plan and

culminates in the preparation of layout sketches, outline specifications, reports and cost estimates of the most suitable of the alternatives.

2.2.8 It is highly preferable, but not of the same magnitude of importance as in the planning and preliminary design stages, for one consultant to accomplish the complete final design for the project. It is usual for the preliminary design and final design of all or selected features of the work to be incorporate in one continuing contract. As was true in the transition period between planning and preliminary design, certain features of the final design could be undertaken before approval of the preliminary design in its entirety, thus minimizing the consultant's projects' related costs between phases.

2.2.9 The final design phase essentially involves the continuation of the preliminary design phase to provide complete details of the construction. The final design culminates with the preparation of detailed contract drawings, specifications, contract documents and cost estimates.

2.2.10 Certain post-design services are frequently provided by the design consultant. These may or may not be included in the original design contract. Since the scope of these services cannot be defined with the same detail or certainty as is the scope for design, it may prove desirable to provide a separate fee basis for their accomplishment.

2.2.11 The post-design services most commonly provided by the design consultant are:

- a) *assistance to the sponsor in securing bids;*
- b) *tabulation and bid analysis;*
- c) *recommendations on award of construction contracts;*
- d) *preparation of supplementary drawings required to resolve unforeseen actual field conditions;*
- e) *checking contractor's shop, erection and construction drawings;*
- f) *reviewing laboratory, shop and mill test reports;*
- g) *making specific visits to the site to observe and report on progress and quality of construction;*
- h) *reviewing requests by contractor for periodic and final payments;*
- i) *preparing a final inspection report and statement of completion;*
- j) *preparing "As Built" drawings;*
- k) *preparing operation and maintenance manuals; and*
- l) *training personnel in operations and maintenance.*

2.3 ASSEMBLY OF BACKGROUND MATERIALS

2.3.1 To ensure the highest degree of responsiveness to request for proposals, potential proposers should be supplied with all available background material pertinent to the project. When this is not practical because of the form of the material or its magnitude, prospective proposers should at least be informed of what information is available and the sources and reliability of the information. If possible, a location where the material can be examined should be provided.

2.3.2 It is in the sponsor's interest to assemble this material before requests for proposals are written so that both the sponsor and the proposers have the best possible mutual understanding of what additional investigation and research are necessary to support a smooth and uninterrupted start-up and progression of the work.

2.3.3 Following, as an example, are lists of data which would be pertinent to the planning process for a new airport to replace or supplement an existing airport.

a) Statistical data:

- 1) relevant economic and population statistics;
- 2) copies of any previously completed traffic forecasts, feasibility studies, site selection studies, master plan studies;
- 3) status of land acquisition;
- 4) current passenger and cargo air traffic summary -
arrival and departure times
aircraft types
load factors
names of airlines using airport;
- 5) current composition of National Air Fleets;
- 6) projected composition of National Air Fleets;
- 7) construction and building cost indices; and
- 8) national and local building codes and standards.

b) Physical data

- 1) topographic maps;
- 2) geological maps;
- 3) earthquake records;

- 4) *soils investigation records/maps;*
- 5) *records of water levels in local wells (or other water table measurements) and records of sustained pumping rates from those wells;*
- 6) *location, size and reliability records of other potential water supply;*
- 7) *location, capacity and reliability records of electricity and communication lines;*
- 8) *location, capacity, and reliability records of natural gas lines;*
- 9) *location of potential outlets for sewage effluent;*
- 10) *locations and evaluations of quantity and quality of potential aggregate sources;*
- 11) *location of major aviation fuel storage and/or pipelines;*
- 12) *location, usage and flight patterns of other airports within 160 km; and*
- 13) *locations and elevations of potential obstructions of airspace, both natural and man-made, within a 32 km radius centred on the aerodrome.*

c) Meteorological data

- 1) *rainfall data: duration, frequency, intensity curves;*
- 2) *wind rose or sufficient data to prepare a wind rose;*
- 3) *cloud cover and ground fog data, visibility; and*
- 4) *temperature and humidity records.*

2.3.4 These lists of desirable data are meant only to be representative of the type of data which would be useful and should not be construed either as all-inclusive or as absolutely required for all projects. Nor is it intended that the sponsor should expend any significant effort in developing this data should it not be available. However, the sponsor should make a reasonable effort to locate the data and compile that which are available. He should also be prepared to inform consultants of the non-availability of data about which the consultants may enquire.

2.3.5 The consultant then will know the extent of the information which he will be required to develop for use in his work and which information he will need only to verify. This will influence the consultant's initial work programme, schedule, manpower allocation, and costs. Therefore, great care should be exercised in describing the

available information when it is not possible to provide copies with the requests for proposal.

2.4 PREPARATION OF MANPOWER AND COST BUDGETS

2.4.1 The methods which may be employed to approximate the consultant's fee are discussed in Chapter 4, Contract Preparation. The selected method may be modified during negotiations as discussed in Chapter 5, Award of Contract.

2.4.2 Curves have been developed plotting the median of fees commonly applied against project construction costs for jobs of above average complexity and jobs of average complexity. Most comprehensive airport projects fall into the first category. These curves are provided for reference in Figures 2-1 and 2-2. It must be noted that these curves are only useful for approximate estimation of fees and cannot be used to determine actual fees. The actual fee can only be determined on the basis of the guidelines contained in Chapter 5 of this manual. However, the curves do provide a reasonable basis for the level of accuracy required for budgeting and scheduling at the early stages of project development.

2.4.3 From the estimated project construction costs, the time schedule and the fee curves, it is possible to determine the approximate manpower which the consultant will be required to provide. The manpower requirements, in turn, will provide direction in the solicitation and selection of consultants. While it is not always true that large firms are not interested in and cannot undertake small projects at reasonable fees, it is certainly not desirable to solicit small firms (which would have to increase their staffs significantly on a temporary basis) for large projects.

2.4.4 The preparation of estimates of project costs and consultant's manpower requirements will be beneficial to the sponsor in several ways:

- a) *they will be useful in scheduling and budgeting the project as a whole;*
- b) *they will be useful in the solicitation and selection of consultants and contractors;*
- c) *they will serve as one of the starting points of the negotiation process; and*
- d) *if the anticipated approximate project construction costs and schedule are announced in the solicitation, consultants can also estimate the manpower requirements. This will beneficially narrow down the number of responses from firms nominally qualified except for size.*

2.5 OFFICE LOCATION AND LOCAL PARTICIPATION

2.5.1 The location of the office for accomplishing the defined tasks may be of significance to the project sponsor, the prospective consultants or both. The sponsor should evaluate the advantages against the disadvantages of requiring the office to be in a specific location. Should the advantages outweigh the disadvantages, the selected location should be stated as a project requirement in the solicitation of expressions of

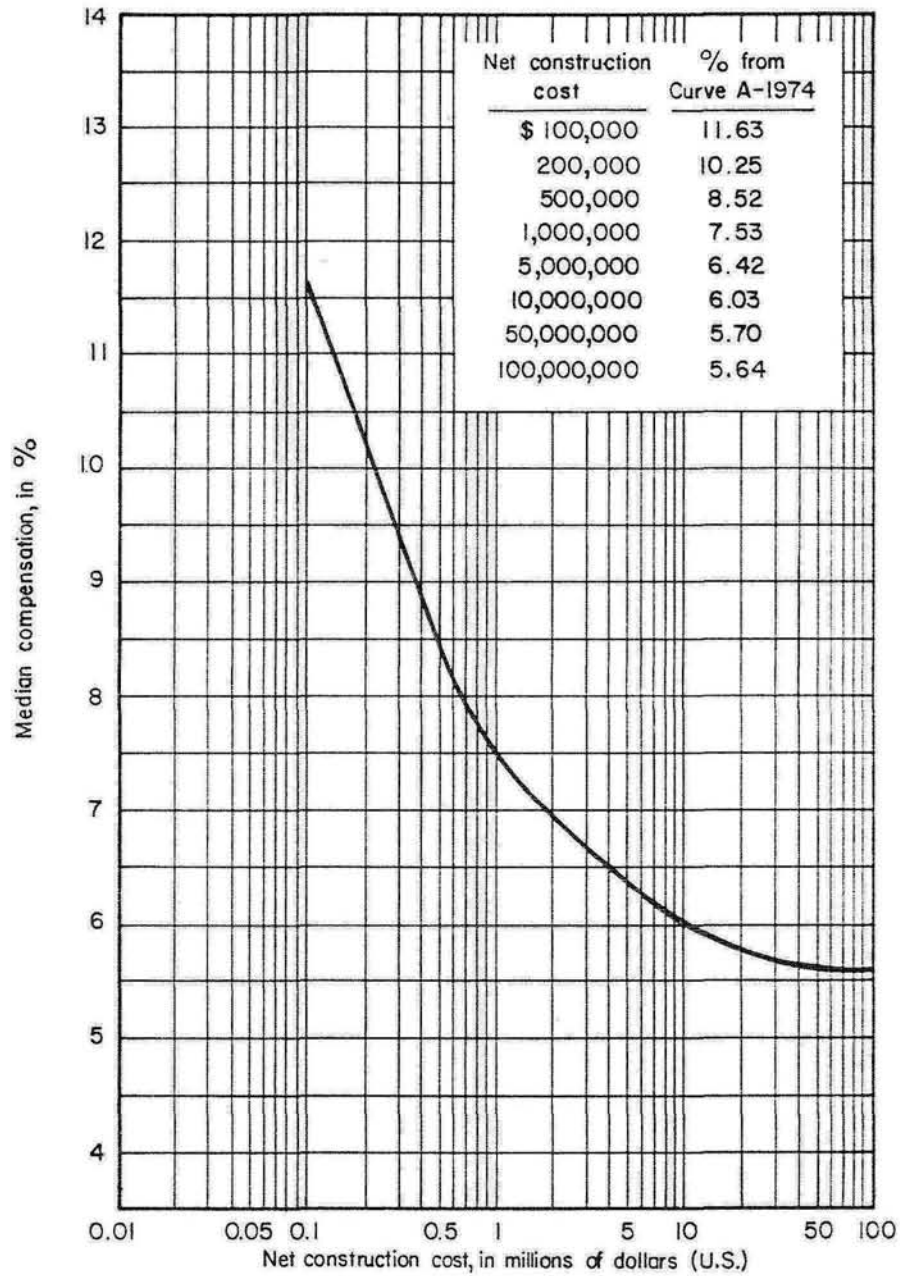


Figure 2-1. Curve A, Median Compensation for Basic Services Expressed as a Percentage of Construction Cost for Projects of Above-Average Complexity (1974)

(Source: ASCE Manual No. 45 (1975))

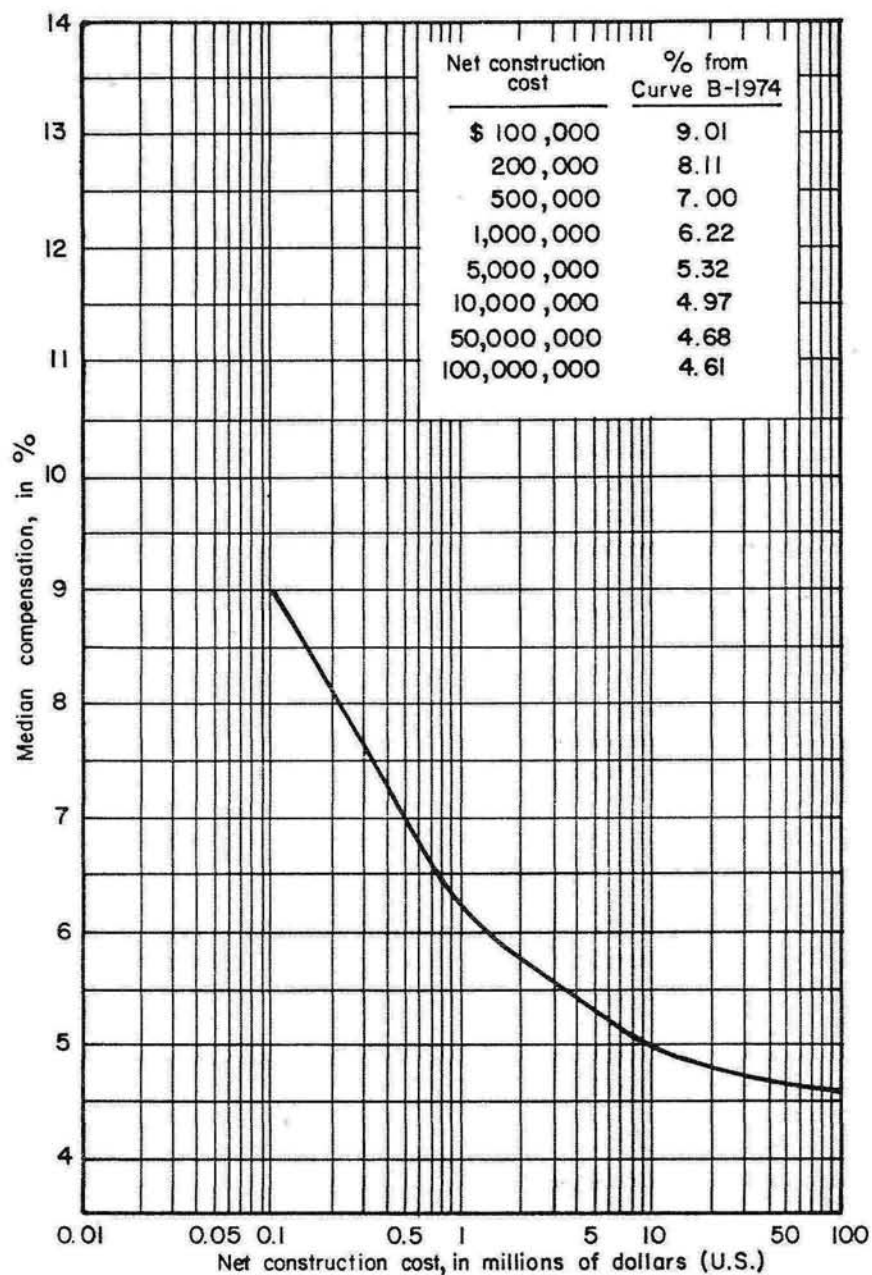


Figure 2-2. Curve B, Median Compensation for Basic Services
Expressed as a Percentage of Construction Cost for
Projects of Average Complexity (1974)

(Source: ASCE Manual No. 45 (1975))

interest and proposals. However, unless there is a compelling and non-negotiable requirement for the work to be done in a specific location, it is preferable to defer resolution of this subject until the contract negotiations are started.

2.5.2 The desirable extent and form of participation by local consultants in the task of the international consultant should be determined, and this extent stated in the solicitation. The extent of this participation will be based on national policies and/or legal requirements and the availability of local consultants and staff. The form of local participation may consist of subcontract(s) to the international prime consultant for specific parts of the task or provision of local manpower to be incorporated into the consultant's staff either to share in the consultant's effort or to acquire experience in specific disciplines.

2.5.3 The primary considerations in determining whether or not a specific office location should be designated are:

- a) *the degree to which co-ordination and review of the consultant's effort is required during the progress of the work and the flexibility of movement within the sponsor's organization to accomplish that co-ordination and review;*
- b) *the extent of local participation desired or mandated and available;*
- c) *the availability of adequately trained local personnel for employment plus the availability of local markets to furnish basic material requirements;*
- d) *the availability of both office space and housing at or near the designated location;*
- e) *the availability and reliability of communications (telephone, cable, mail, etc.) chiefly for technical matters, but also for personnel and administrative concerns;*
- f) *the degree of intimacy with the project site needed by the consultant's staff;*
- g) *the anticipated project costs of performing the work at a designated site compared with costs of performing the work in the consultant's home office or at a location selected by the consultant;*
- h) *the availability and willingness of consultant's key staff to relocate for the duration of the project; and*
- i) *the availability to the sponsor of foreign currency and legal restrictions on the disbursements of foreign and local currency.*

2.6 SCHEDULE OF PAYMENTS AND CURRENCY

2.6.1 The schedule of payments and the currency to be used will usually be a subject to be discussed and agreed upon at a later date during negotiations. Those agreements are then incorporated into the contract between the sponsor and the consultant. Any legal and non-negotiable currency restrictions should be clearly identified in the terms of reference.

2.6.2 The schedule of payments is largely dependent on the fee basis of the contract. For lump sum fee contract or for fees based on a percentage of construction costs, the schedule should call for fixed incremental (generally monthly) payments or for a variable increment payments based on progress of the work. For those contracts in which the reimbursement is a function of the consultant's actual costs, the schedule should call for variable incremental payments based on actual consultant costs. Most contracts for consulting services call for reimbursement of personnel costs in the currency of the consultant's home country and other costs in the currency of the country where the expenses are incurred. Any currency on which both the sponsor and the consultant can agree is acceptable provided that consideration of exchange rates and inflation are clearly elaborated.

2.6.3 Since the scheduling of payments is only one of the factors to be considered in the selection of the appropriate type of contract for the work, no recommendations are made here. However, attention is called to the extent of the sponsor's administrative responsibility and effort inherent in each system.

2.6.4 The amount of the consultant's fees will, of course, be influenced by the amount of taxes that will be levied against his organization, his personal income, and the staff salaries earned in the sponsor's nation. By far the simplest way of dealing with this is for the sponsor to take upon himself the payment of these taxes, in effect creating a tax-free situation for the consultant. This is unfortunately, not always legally acceptable in some States. Since this is a subject which will arise during the preparation of the consultant's fee proposal and the subsequent negotiations, the sponsor should determine the extent of the applicable taxes and communicate this as a part of the terms of reference in the request for proposals. The usual practice is for any taxes levied beyond those initially stipulated, as a result of new legislation, to be reimbursed by the sponsor to the consultant.

2.7 TERMS OF REFERENCE

2.7.1 Terms of reference should be prepared with as much detail as possible to reduce the potential for misunderstandings and consequent disputes arising from such misunderstandings. Everything pertinent to the expeditious and professional completion of the work should be disclosed with nothing held back for the sake of a presumed advantage during the contract negotiations or in the course of work. It is extremely important that the sponsor and the consultant develop a mutual respect and understanding if the work is to proceed smoothly. A vital element in achieving this is complete openness and frankness on both sides, both before and after contract award.

2.7.2 The terms of reference incorporated into the request for proposals should include, as a minimum:

- a) *The project background: an historical résumé of the origins and growth of an existing facility; its physical and*

geographical characteristics; its management and operational organization; and the circumstances leading to the need for modification, expansion or replacement. It is desirable to provide appropriate maps and/or plans of the facility and its surroundings to supplement the written background.

- b) The objectives of this project: the anticipated interim and ultimate demands and/or capacities; the level of service to be provided; aesthetic considerations; integration with other transportation facilities.*
- c) A description of available information and data which the sponsor will provide (see 2.3).*
- d) A description of the sponsor's institutional framework and listing of the sponsor's responsibilities including: timely review of the work; co-ordination with governmental agencies; prompt payment of invoices; logistic support (if appropriate) for consultant.*
- e) A listing of the consultant's responsibilities including: a thorough elaboration of the scope and schedule of the work; the basis of design and applicable standards; compliance with insurance and guarantee requirements; compliance with management and staffing of project as set forth in his proposal; maintenance of a local office (if required); making available to the sponsor all project records and correspondence.*
- f) The language(s) in which reports, drawings and specifications are to be prepared and the system of weights and measures to be used.*
- g) The sizes, scales and materials to be used in the preparation of drawings and reports.*
- h) The timing of submittals and reviews.*
- i) Type of fee basis mandated or desired or a statement that the proposers should state their preference; and the currency to be used.*
- j) Any requirement for association with local consultants.*
- k) Instructions to proposers (see 2.9).*

2.8 SCOPE OF WORK

2.8.1 The scope of work for each task should be defined as completely as possible. The degree of the detail will, of course, vary with the type and magnitude of the task.

2.8.2 Planning projects are the most difficult types for which to prepare an explicit scope of work. They frequently have, as a basis, only an apparent need which should be satisfied and a tentative budget and time schedule, both for the planning and construction phases, within which it is to be accomplished. For this reason, the scope of work for a planning project is often best defined by describing in detail the end product to be produced by the consultant. It should, however, list all the factors which are to be investigated and taken into consideration in the pre-planning stage of the work and the number and types of alternatives to be studied in the planning stage.

2.8.3 The scope of work for preliminary design tasks can be defined somewhat more precisely. However, since the preliminary design is only one of the evolutionary steps leading to a completed project, there are also limits to the precision of its description.

2.8.4 There exists a considerable range of opinion within the design community as to the proper cut-off point between preliminary design and final design. Since it is highly desirable to have the consultant who does the preliminary design also do the final design, it is suggested that these two phases of the work be combined in one contract, making that distinction academic.

2.8.5 The scope of work for final design tasks should list each separate element (building, utility, pavements, etc.) of the project, its size, function and design requirements. The description of the functional requirement of each element is especially significant, because the required appurtenances of each element are usually implicit in that description. The scope of work for a preliminary/final design contract should also describe the composition and detail required as the end product of that design. To illustrate this point, some examples are listed below:

- a) *the scope of work should state whether or not it is required to draw cross-sections of the earthwork movement and, if so, the scales and intervals desired;*
- b) *the scope of work should state whether or not it is required to prepare formal longitudinal profiles for exterior utility systems;*
- c) *the scope of work should state whether or not reinforcement details are required for reinforced concrete structures; and*
- d) *the degree of desired itemization of the engineer's estimates should be expressed, including the requirement or lack of requirement for breakdowns of material, labour, equipment and plant.*

2.9 INSTRUCTIONS TO PROPOSERS

2.9.1 Instructions concerning the format and content of proposals should be furnished in the solicitations which allow as much freedom of expression as possible to the individual proposers while also providing a reasonable means of comparative evaluation of proposals. The determination of the basis of that evaluation (see 3.3) should be made before the instructions are finalized and that basis should be explained to

prospective proposers in the instructions. Proposers should be informed as to the depth of detail desired in the proposal for the following items:

- a) *the proposed methodology for accomplishing the work;*
- b) *the management and composition of the project staff, including sub-consultants if required;*
- c) *the estimated manpower requirement and schedule for each discipline in each subdivision of the work;*
- d) *the plans and/or documents to be completed for each stage or item of work; and*
- e) *the work histories of the key staff and management who will be assigned to the project.*

2.9.2 Consultants should be required to submit their proposals in strict accordance with the terms of reference in the request for proposals. However, they should be encouraged to make any suggestions they feel might be appropriate and of value to the sponsor regarding any aspect of the project. These suggestions should indicate the extent to which the proposal would be modified if the suggestions were accepted.

2.9.3 To ensure that all proposers are treated equally and fairly, the instructions should be clear and precise as to the form, timing and location for submission of proposals. The anticipated date for completion of the selection and notification of the selected consultant should be stated.

CHAPTER 3.- SELECTION OF CONSULTANTS

3.1 INTRODUCTION

3.1.1 The selection of a consultant is not complete until a contract has been signed by the consultant and the project sponsor with the approval of any other organization if required. Selection, then, is a two step process, the first being the initial selection of a consultant on the basis of merit; the second being the reaching of agreement with him on contract terms.

3.1.2 The negotiating process and award of contract are discussed in subsequent chapters of this manual. Should the negotiations with the tentative selectee fail or required contract approvals not be obtained, the procedures described in this chapter would be repeated starting at an appropriate step as dictated by law or circumstances.

3.1.3 Before the selection process is undertaken, the sponsor should establish an administrative policy within his own organization for designating persons authorized to select or recommend consultants for various assignments. The persons designated may include the administrator, or the department head, to be supplemented by others to make up a selection board. The persons empowered to make the selection must be kept free of pressures, both internal and external. In most cases, the most satisfactory procedure would be to utilize a board of three, at least one but preferably more of whom should be an engineer or architect. The board should also have a member competent to analyse the legal and financial implications of each proposal or have such an analysis made outside the board and a separate report presented. The board should conduct investigations and make recommendations, holding such interviews and inquiries as they feel may be desirable. The final selection should be by the administrator or governing body of the sponsor based upon recommendations by the board.

3.2 SOLICITATION PROCEDURES

3.2.1 When the work required of a consultant is similar or comparable, in magnitude, type and complexity to work which has been previously completed by a particular consultant for the sponsor (or any organization well known to the sponsor), it may well be in the sponsor's interest to make a direct approach to that consultant for the new work provided that:

- a) *the direct approach to a single consultant is legal, consistent with the government policy and is approved by lending or other agencies when this approval is required;*
- b) *the previous work was technically satisfactory, completed on time within the budget;*
- c) *the consultant is under the same management and still employs many of the key staff who participated in the earlier work;*

- d) *the consultant is willing and able to commit those key managerial and technical staff to the new work; and*
- e) *no significant benefit will accrue to the project by examination of more than one approach to the conduct of the work and/or the design of the project, per se.*

3.2.2 Unless all these conditions are satisfied it is probably more desirable to solicit several consulting firms before selecting one to perform the work. There are two basic types of solicitation which have been employed effectively for this type of work. These are solicitation by direct invitation and solicitation by broad advertisement.

3.2.3 Solicitation by direct invitation

3.2.3.1 It is recommended that no less than three consultants be approached by direct invitation for proposals. Sources for obtaining the names of potentially qualified consultants are listed in 3.5.

3.2.3.2 The direct invitation procedure is as follows. From the list of consultants determine those that appear to be best qualified for the particular project. Write separate letters to each of them describing briefly the proposed project and inquiring as to their interest. In the case of design projects, give each consultant an opportunity to inspect the site, explaining to him the proposed services required. Review the qualifications and records of each firm and its capability to complete the work within the time allotted. Those consultants who exhibit the desired qualifications and express an active interest in the project should then be requested to submit binding proposals. This request should be formal and the terms of reference including the scope of work should be defined with all possible detail.

3.2.4 Solicitation by broad advertisement

3.2.4.1 This form of solicitation is ordinarily accomplished in two steps; the first step being an advertisement in all appropriate publications requesting those consultants interested in the project to submit expressions of interest and statements of qualifications. The second step is the analysis of these expressions and qualifications and the establishment of a short list of consultants (generally no less than three) who would be invited to submit formal proposals for the work. While there is an inherent time loss in this procedure, and a potentially large effort required of the sponsor's organization to analyse a great number of responses, the great number of responses in itself is an advantage in that it creates a greater freedom of selectivity.

3.2.4.2 In the request for expressions of interest and statements of qualifications the terms of reference need not be elaborated in as much depth as in the subsequent request for proposals. As a minimum, however, it should describe the size, type, location and time schedule for the project. The request for proposals should incorporate all the information discussed in 2.7 and 2.8.

3.2.4.3 The format of the responses for expressions of interest and statements of qualifications should be left to the discretion of the individual responding consultants. Many consulting firms have prepared their own standard forms and brochures which will suit this purpose. However, it is advisable that the request should contain a list of the minimum data required for consideration of advancement of the respondent to the short list of consultants from whom proposals will be solicited.

3.2.4.4 A typical form which could be used to solicit that data is included in Table 3-1. It should be modified or supplemented in accordance with the specific requirements of each project.

3.3 REVIEW AND SELECTION PROCESS

3.3.1 The broad range of project sizes for which this manual is intended to provide guidance, together with the range in scope of tasks to be accomplished makes it virtually impossible to establish specific guidelines for analysis of expressions of interest and statements of qualifications. The selection board conducting this review should carefully examine the nature of the proposed project and the scope of services to be provided under each contract. A general criteria for selection should be established in keeping with national policy and resources, project requirements and administrative resources. Following this, specific criteria should be established within that general framework, for each proposed contract. Each element of the criteria listed will not have the same importance as the others, nor will the relative importance of each element remain constant for each contract of each project.

3.3.2 A means of evaluation in common usage is the creation of a matrix in which each criterion is assigned a numerical value in accordance with its relative importance. Each respondent can then be graded, (again on a numerical basis) according to this apparent compliance with each criterion. The sum of the products then provides a ranking of respondents. Since the determination of the relative importance of each criterion and the degree of compliance are each rather subjective functions, it is suggested that these determinations be made individually by several qualified people and the results averaged to provide a final ranking. Any wide disparity in the ranking of any consultant among the reviewers should be carefully examined. The list of representative factors which follows is not intended to designate order of importance, which should be considered and determined separately for each contract. Nor is it intended to exclude other factors which may be significant for a specific contract:

- a) *completeness and clarity of response;*
- b) *recent experience on similar projects;*
- c) *experience records of key staff and project manager;*
- d) *experience in sponsor's geographical region;*
- e) *experience in sponsor's nation;*
- f) *current workload compared to size of company;*
- g) *willingness to establish branch office;*
- h) *willingness to co-operate with local firms;*
- i) *willingness to commit key staff to project; and*
- j) *ability to supply technical and financial references.*

CONSULTING FIRM REGISTRATION FORM**A. FIRM DESCRIPTION****1-10. NAME, ADDRESS, TYPE OF ORGANIZATION.**

1. Number				Please do not write in shaded areas				2. DATE			
								DAY MONTH YEAR			
3. Name of Firm (full name)								Acronym (if any)			
								Year Established			
4. Address of Home Office											
Street Address								Telephone No.			
P.O. Box (if any)		City			State (Province)			Cable Address			
Postal Code		Country			Country Code			Telex No.			
Officer(s) or Partner(s) to be Contacted (name, title)											
5. Former Name(s) of Firm (full name)								Acronym (if any)			
								Year Established			
6. Type of Organization (check one of the spaces below)											
a Partnership Firm		b Private Company		c Public Corporation		d Government- Assisted Firm		e State Enterprise		f Other	
Is this firm owned wholly or partly by, or does this firm wholly or partly own, an organization engaged in manufacturing, construction or product processing?										☐ Yes	
										☐ No	
7. Countries Outside Home Country in Which Firm/Entity has Branch Offices											
Country Code		Countries			Country Code		Countries			Country Code	
8. Principal nationality of firm ownership											
9. Firm Membership in Professional Associations											
10. Firms with which the Registering Firm is Affiliated											
No.	Full name					Type of Affili-ate	Acronym (if any)	Country Code			
Is, as of this date, the information furnished in this form accurate and true to the best of my knowledge											
(Name and title of person signing)										(Signature)	

Table 3-1. Consulting Firm Registration Form

A. FIRM DESCRIPTION**11-14. PERSONNEL, LANGUAGE CAPABILITY, FEES, BANK REFERENCES**

11. Personnel of Firm/Entity by Broad Occupational Groups											
a. Engineers Aeronautical		b. Engineers Civil		c. Architects and Urban Planners		d. Engineers Mechanical		e. Engineers Electrical		f. Engineers Electronic	
full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time
g. ATC Specialists		h. Educators and Training Specialists		i. Economists		j. Operations and Management Specialists		k. Science and Technology Specialists		l. Surveyors, Estimators and Inspectors	
full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time
m. Technicians and Draftsmen		n. Administrative and Support Staff		o. Other (specify)		p. Other (specify)		q. Other (specify)		r. Grand Total	
full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time

12. Language Capability of Professional Personnel of Firm/Entity											
Please indicate language capability, specify other languages under F to J.											
A. English	☐	C. Spanish	☐	E. Arabic	☐	G.	☐	I.	☐		
B. French	☐	D. Russian	☐	F.	☐	H.	☐	J.	☐		

13. Annual Volumes of Gross Fees of Firm/Entity					
(enter fees for last five full years preceding form submission date.)	Year		Annual Volume of Gross Fees (in US\$ millions to 2 decimal places)		☐
			As Prime Consulting Firm	As Associate and/or Joint Venture Firm ¹	Total
		US\$m			
		US\$m			
		US\$m			
		US\$m			
		US\$m			
		US\$m			Grand Total

¹Include only your firm/entity's portion of fees earned as an associate and/or joint venture firm

14. Bank or Other Financial Reference(s) of Firm/Entity (enter name and full address for each reference)

B. FIRM CAPABILITY**15-16. SPECIALIZATION, SERVICES** (* please check also all appropriate fields on page 3)

15. Major fields in which firm specializes:
16. Type of services provided:

Table 3-1. Consulting Firm Registration Form

B. FIRM CAPABILITY

Please check where applicable

FIELDS OF SPECIALIZATION	17. TYPES OF SERVICES BY SECTOR										
	A. SURVEYS (Aerial, Geological, Soil, Site etc.)	B. PLANNING (Regional Development Plans, Airport Master Plans etc.)	C. STUDIES (Feasibility, Economic, Financial, Technical, etc.)	D. DESIGN (Architectural, Engineering)	E. PREPARATION OF CONTRACT DOCUMENTS & BID EVALUATION	F. PROJECT MANAGEMENT (Supervisory/Inspection, Technical Advisory Service, Turnkey Operations)	G. SUPPLY OF EQUIPMENT	H. INSTALLATION OF SYSTEMS	I. OPERATIONS & MAINTENANCE (Maintenance Planning)	J. INFORMATION SYSTEMS & ELECTRONIC DATA PROCESSING	K. INSTITUTIONAL STRENGTHENING (Organizational/Management Studies and Advisory Service)
ED EDUCATION & TRAINING											
1. Schools, General											
2. Flight Training											
3. ATC Services											
4. Radio/NAVAIDS maintenance											
5. Aircraft Maintenance											
6. Other											
TR AIRPORTS & AIR TRANSPORTATION											
7. Airport Management											
8. Airport Layouts and Civil Works											
9. Power Distribution and Lighting											
10. Structures (Terminals, Freight Handling Facilities)											
11. Fire Fighting Services											
12. Meteorological Systems											
13. ATC Services											
14. NAVAIDS & Radar											
15. Aviation Security											
16. Aircraft Maintenance											
17. Air Transport Demand Forecasts											
18. Air Transport Economics											
19. Airline Management											
20. Other											
TE TELECOMMUNICATIONS											
21. Overall Network											
22. HF COM Systems											
23. VHF COM Systems											
24. Radio Relay Systems											
25. Data COM Systems											
26. Satellite COM Systems											
27. Small Scale COM Systems (Telephone, Intercom)											
28. Other											
MS MISCELLANEOUS											

Table 3-1. Consulting Firm Registration Form (Cont'd)

Projects for Which Firm/Entity is Providing Services Now or Has Provided Services in the Past 5 years.			
Year of Execution	Project Description	Sector(s) in which Firm/Entity Provided Services on this Project	Project Country

Table 3-1. Consulting Firm Registration Form (Cont'd)

3.3.3 Following the ranking of consultants who have submitted their expressions of interest and statements of qualifications, all those who have not been selected for the "short list" should be so notified. A sample notification letter is provided in Table 3-2. Those who have been selected should also be notified and informed of the procedures and timing of the next steps in the selection process. If the request for proposals has been formulated at this time, it should be sent as soon as possible to afford prospective consultants the maximum time available for preparation of their proposals. If the request for proposals has not been completed, even terms of reference which are identified as preliminary will be useful to prospective consultants. The more time available for the preparation of proposals, the more informed and responsive the proposals can be. It should, however, be recognized that no consultants can reasonably be expected to make firm commitments of staff for projects that are not anticipated to start more than several months in the future.

3.3.4 At this time, a check should be made with recent clients of each consultant on the short list to determine the quality of past performance. A sample letter of request has been provided in Table 3-3. This check should not be limited to the references specified by the consultants but should extend to the sponsors of any projects listed in the consultant's statement of qualifications. Should any negative factors such as design deficiencies, failure to meet schedules or poor record keeping be revealed in this check, the consultant should be afforded an opportunity for explanation or rebuttal.

3.3.5 The requests for proposal to be sent to the consultants on the short list or to those otherwise selected should contain the definitive statement of the work and the conditions under which the work is to be accomplished. Any conditions not covered in the requests for proposal will be construed by the consultants to mean that that aspect of the work is to be performed at the consultant's discretion. This is certainly acceptable and at times advantageous since the proposals then may offer alternatives providing the sponsor with an opportunity to choose the most favourable.

3.3.6 The proposals offered by the consultants on the short list should then be examined and ranked in the same general manner employed in the creation of the short list. This examination should be more intensive than the first since the proposals are related to the specific project and display the consultant's intended approach, organization and schedule for accomplishing the work.

3.3.7 A series of sample forms is provided in Table 3-4 as a guideline for ranking of the proposals. These forms are comprehensive and require a large expenditure of effort. They are, therefore, intended for use on large, comprehensive and complex projects and should be simplified for applicability to smaller, less complex projects. If the size or complexity of the project warrants it, the review and ranking should be done by a team of experts. Competing consultants can be interviewed at this stage to establish rapport, to listen to their presentations, to question them and to allow them to present their questions.

3.3.8 When an order of merit has been established, all firms who will not receive further consideration should be so advised. A sample letter is included in Table 3-5. The firm listed as first in the merit list should be invited to discuss and enter into negotiations on its proposal, the contract terms and the fee structure. During these negotiations, the details of the terms of reference should be reviewed completely to ensure full mutual understanding. Discussions should include the contractual and legal requirements of the agreement and the detailed costs.

Table 3-2. Letter of notice to
firms not selected to submit proposals

(Insert Name and Address)

Dear _____:

We have carefully reviewed all the expressions of interest received from various firms which responded to our announcement for the _____ project. We regret to advise that your firm was not one of those selected for the development of a technical proposal. We want to thank you for your submission and to say that we appreciate your interest in (insert identity of project) and hope that you will continue to be interested in projects of (name of sponsor).

Very truly yours,

Table 3-3. Letter requesting references
from a consultant's previous client

Dear (insert name)

The consulting firm (consultant's name) is a candidate for the award of a contract for (function) of (project). He has given us his permission to contact you regarding his performance of the (function) of (project).

We would appreciate a brief description of the project, (consultant's name) role in the project and an evaluation of his accomplishment, particularly in regard to technical competence and adherence to schedule.

Very truly yours,

Note: These sample rating forms have been prepared for use in the evaluation of proposals for large and/or complex projects. The forms should be simplified and condensed to an appropriate degree for use in the evaluation of smaller less complex projects. Every project and task has some unique characteristics, making it virtually impossible to prepare a "standard" evaluation form. It is suggested that the list of items to be considered for the proposal evaluation and the values assigned to them, be prepared separately by at least two (but preferably more) individuals and a final rating system be prepared on this basis of consensus. On the sample forms following, values (point allocations) have been assigned arbitrarily to each item. The only purpose for including these values is to clarify the usage of the forms; no other significance should be inferred.

PROPOSAL SUBMITTAL CHECKLIST

Inclusion and coverage of the following, in accordance with TOR requirements:

A* M* NA*

PROJECT OVERVIEW

WORK PROGRAMME - Task description, bar chart, CPM schedule

ORGANIZATION AND MANPOWER

- Organization of participating firms
- Local association role
- Organization chart
- Personnel assignment schedule
- Manpower breakdown by task and individual
- Curricula vitae for all professionals and in the detail specified in TOR

QUALIFICATION OF PROPOSER

For each international firm

- Firm description
- Organization
- Financial status
- Clarification statements re conflicts of interest and litigations
- Experience on similar projects
- Experience on related projects
- Local associate

Total no. As, Ms, NAs

* A = adequate; M = marginal; NA = not adequate or not included

Additional questions:

Yes No Not determined

1. Was proposal submitted by deadline?
2. Is the proposing group comprised of the same members and formed the same way as for prequalifications?
3. Is there any data or information which is not included and which does not permit the evaluator to complete the evaluation objectively, without making unsubstantiated assumptions?

RATING FORMEvaluation of technical proposals for airport project

<u>Date received</u>	<u>Evaluation date(s)</u>	<u>Evaluator</u>
_____	_____	_____

Name of proposing group or firm: _____

<u>Member firms</u>	<u>Role*</u>	<u>%Partici- pation**</u>	<u>Nationality</u>
(A) _____	_____	_____	_____
(B) _____	_____	_____	_____
(C) _____	_____	_____	_____
(D) _____	_____	_____	_____

SUMMARY OF SCORING

			<u>SCORE***</u>
PART A. PROPOSAL (350 points)			
1. Overall quality of proposal	35 points		_____
2. Overview of project	40 points		_____
3. Work programme & task coverage	185 points		_____
4. Organization	<u>90 points</u>		_____
Sub-total	<u>350 points</u>		_____
PART B. EXPERIENCE & EXPERTISE (200 points)			
1. General	30 points		_____
2. Studies	80 points		_____
3. Design	60 points		_____
4. Supervision of construction	<u>30 points</u>		_____
Sub-total	<u>200 points</u>		_____
PART C. PERSONNEL (450 points)			
TOTAL			<u>1 000 points</u>

* P=principal; JV=member of joint venture or consortium; SC=participating as an outside consultant or subcontractor; OTHER=(specify by footnote).

** To be developed using Professional man-months - for breakdown by firm, see Part C, Personnel.

*** Fill in appropriate column or space.

PART A - PROPOSAL (350 points)
(Interpolation between scoring guidelines is appropriate)

SCORE

1. OVERALL QUALITY OF PROPOSAL (35 points)
(As a guide, review "checklist", page 2)

a) Clarity of presentation
Excellent (15); Good (10); Fair (5); Poor (0) _____

b) Completeness of presentation
Excellent (20); Good (10); Fair (5); Poor (0) _____

A.1 Sub-total _____

2. OVERVIEW OF PROJECT (40 points)

a) Proposer's familiarization with and understanding of the project
Excellent (15); Good (10); Fair (5); Poor (0) _____

b) Proposer's statements regarding development of the project, constructive views on TOR, elaboration or emphasis of certain aspects of the project, etc.
Excellent (25); Good (15); Fair (5); Poor (0) _____

A.2 Sub-total _____

3. WORK PROGRAMME AND TASK COVERAGE (185 points)

a) Overall technical approach to accomplishing the work, including constructive alternative means for accomplishing the work
Excellent (20); Good (15); Fair (10); Poor (0) _____

b) Suitability of work plan, thoroughness of coverage of scope of work, and description of how work (not only that work) will be carried out* (By task area, assign appropriate score.)

<u>Task area</u>	<u>Excel- lent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Score</u>
1. Data collection and surveys	15	10	5	0	_____
2. Forecasting and programming	15	10	5	0	_____
3. Development of alternatives and master plan	15	10	5	0	_____
4. Preliminary design	10	5	0	0	_____
5. Final design	20	15	10	0	_____
6. Post design services	10	5	0	0	_____

Sub-total 3 b) _____

3 a) & 3 b) carry forward _____

* May want to consult the manpower allocation which indicates task areas being emphasized.

PART A - PROPOSAL (350 points) (Cont'd)

3. WORK PROGRAMME AND TASK COVERAGE (Cont'd) Score brought forward. _____

- c) Suitability of task division & scheduling to accomplish the work and meet TOR deadlines:
Excellent (20); Good (15); Fair (10); Poor (0) _____

- d) Coverage of tasks by professional personnel - suitability of staff assignments (are disciplines and expertise of individuals assigned in accordance with the scope of work of tasks to which they are assigned?) - by task area as follows:

<u>Task area</u>	<u>Good</u>	<u>Fair</u>	<u>Marginal</u>	<u>Score</u>
1. Airfield	10	5	0	_____
2. Infrastructure	10	5	0	_____
3. Terminal area	10	5	0	_____
4. Terminal building	10	5	0	_____
5. Support and ancillary areas	10	5	0	_____
6. Support and ancillary buildings	10	5	0	_____

Sub-total 3 d) _____

A.3 Sub-total _____

4. ORGANIZATION (90 points)

- a) Proposer's organization structure to perform the work (number and inter-relationship of firms)*:
Well organized (20); Workable (10); Questionable (0) _____

- b) Local participation in performing the work:
Good (20); Fair (10); Poor (0) _____

- c) Proposer's logistical plan to accomplish the work, i.e. breakdown of work done locally and abroad and on and off site:
Good (20); Fair (10); Questionable (0) _____

- d) Effective use of personnel on project (is scheduling such that excessive mobilization is not incurred; are an excessive number of short-term experts proposed?):
Good (20); Fair (10); Poor (0) _____

- e) Adequacy and attention paid to proposed non-professional support staff (surveyors, draftsmen, other technicians, etc.):
Good (10); Fair (5); Poor (0) _____

A.4 Sub-total _____

PART A - TOTAL _____

* For joint ventures or a consortium of many firms, consideration should be given to previous working relationships, manageability of the consortium and combined efforts and allocation of responsibilities for the subject firms.

PART B - PROPOSER'S EXPERIENCE (RECENT) & EXPERTISE (200 points)¹

	<u>RATING²</u>	X	<u>WEIGHT FACTOR</u>	=	<u>SCORE</u>
1. GENERAL (30 points)					
a) Handling of contracts of comparative size and complexity	_____	X	2.5	=	_____
b) Experience in country or region	_____	X	5.0	=	_____
			Sub-total		_____
2. STUDIES (80 points)					
a) Air and ground traffic	_____	X	3.0	=	_____
b) Utility demand and supply	_____	X	1.0	=	_____
c) Site selection	_____	X	2.0	=	_____
d) Airspace	_____	X	1.0	=	_____
e) Geotechnical	_____	X	1.0	=	_____
f) Environmental	_____	X	1.0	=	_____
g) Airfield layout	_____	X	2.0	=	_____
h) Terminal area layout	_____	X	3.0	=	_____
i) Terminal building	_____	X	3.0	=	_____
j) Composite master plan	_____	X	3.0	=	_____
			Sub-total		_____
3. DESIGN (60 points)					
a) Airfield	_____	X	3.0	=	_____
b) Terminal buildings	_____	X	3.0	=	_____
c) Cargo buildings & hangars	_____	X	3.0	=	_____
d) Utility systems	_____	X	2.5	=	_____
e) Roads	_____	X	2.5	=	_____
f) Aircraft fuelling systems	_____	X	1.0	=	_____
			Sub-total		_____
4. SUPERVISION OF CONSTRUCTION (30 points)					
a) Buildings	_____	X	3.0	=	_____
b) Airfield and roads	_____	X	2.5	=	_____
c) Utility systems	_____	X	2.0	=	_____
			Sub-total		_____
			PART B TOTAL =		_____

¹Consider number, size or length and location of applicable projects undertaken in the last 10 years. Also, the role or percentage of work undertaken by the firm on those projects.

²Rating: 4 = Outstanding; 3 = Good; 2 = Adequate; 1 = Marginal; 0 = Not demonstrated.

PART C - PERSONNEL (450 points)

BASIC SCORES TO BE USED IN ASSESSMENT OF PROFESSIONAL EXPERIENCE

<u>ASPECT</u>	<u>SCORE</u>
EDUCATION	10
OVERALL EXPERIENCE	5
PERTINENT EXPERIENCE	20
WITH FIRM	5
WORK ABROAD	10
TOTAL	50 points/person

I. PROJECT MANAGEMENT (pick 3) (150 total points)

NAME	POSITION	TITLE	SCORE
1.			
2.			
3.			
			Sub-total C-1 _____

II. KEY PROFESSIONAL STAFF (pick 6) (300 total points)

NAME	POSITION	TITLE	SCORE
1.			
2.			
3.			
4.			
5.			
6.			
			Sub-total C-2 _____
			TOTAL PART C _____

Table 3-5.- Letter of notice to
firms whose proposals will not be considered further

(Insert Name and Address)

Dear _____:

We carefully evaluated the proposal you submitted to us on the _____ project. We regret to advise that your firm was not selected for the negotiation of the contract.

We want to thank you very much for your proposal and to say that we appreciate your interest in (insert identity of project) and hope that you will continue to be interested in projects of (name of sponsor).

Very truly yours,

3.3.9 If agreement is not reached with the first ranked firm, it should be notified in writing. The second ranked firm should be invited for negotiations and so on until a satisfactory agreement is reached. Once a firm has been rejected, it is not considered ethical to reopen negotiations. When agreement has been reached, all those firms not previously advised should be notified.

3.3.10 The above-mentioned sample letters are not intended to supersede standard (or individual) letters which the sponsor may choose to write. They are intended only as guidelines to the extent of information which should be provided. The preparation of proposals usually involves considerable cost and effort to consultants. Inquiries from consultants as to the reasons for non-selection are not unusual. Responses to such letters may carry certain legal implications and should be formulated with that in mind. However, responses should be as complete as possible for the mutual benefit of the sponsor and the consultant on other potential projects.

3.4 FEE PROPOSAL

3.4.1 Many States and organizations do not request a fee proposal until the technical proposals have been examined and the consultant selected. Other States and organizations prefer or are required by law to request and receive fee proposals simultaneously with the technical proposals. When this is done, the preferred method is for the consultants to submit technical and fee proposals in separate, sealed envelopes.

3.4.2 The technical proposals are then all opened and examined before the fee proposals are opened. The purpose of this is to ensure that the evaluation of the technical proposals is not consciously or subconsciously influenced by the fee proposals.

3.4.3 Following the ranking of consultants on the basis of the evaluation of the technical proposals, the fee proposals should be opened and examined. Unless there are significant differences in the proposed fees, selection of the consultant should be made on the basis of the technical proposals. If there are significant differences, the technical proposals should be re-examined to determine whether there are differences in the proposed work programme which account for the difference in fee.

3.4.4 The sponsor should recognize that the quality and timeliness of the design effort may produce a savings in construction costs which may well outweigh any savings in design fees.

3.5 SOURCES FOR LOCATING QUALIFIED FIRMS

3.5.1 There are several excellent sources for locating qualified consulting firms. In general, none of the organizations listed below will recommend a particular firm; they will provide several names. In some cases, the list may contain names of firms for which the files do not have complete or up-to-date information. It is worth while to obtain names of prospective consultants from more than one source when possible. Among the organizations that maintain files containing information concerning consultants are:

- a) *The International Federation of Consulting Engineers (FIDIC) comprising the following national bodies:*

Australia

The Association of Consulting Engineers, Australia

Belgium

*Chambre des Ingénieurs-Conseils de Belgique
Kamer van Raadgevende Ingenieurs van België*

Brazil

Associação Brasileira de Consultores de Engenharia

Canada

Association of Consulting Engineers of Canada

Denmark

Foreningen af Rådgivende Ingeniører

Finland

*Suomen Neuvottelevion Insinöörien Liitto
Finlands Konsulterande Ingenjörers Förbund*

France

Chambre des Ingénieurs-Conseils de France

Germany (Federal Republic of)

Verband Beratender Ingenieure - VBI

Hong Kong

The Association of Consulting Engineers, Hong Kong

Iceland

Félag Ráðgjafarverkfræðinga

Iran (Islamic Republic of)

Iranian Association of Consulting Engineers

Ireland

*Cumman Innealtoiri Comhairle na h-Eireann
Association of Consulting Engineers of Ireland*

Israel

The Israel Association of Consulting Engineers

Italy

Associazione Ingegneri Consultanti Italiani

Japan

The Association of Japanese Consulting Engineers

Kenya

The Association of Consulting Engineers of Kenya

Luxembourg

Chambre des Ingénieurs-Conseils du Grand-Duché de Luxembourg

Malawi

The Association of Consulting Engineers of Central Africa

Netherlands (Kingdom of the)

Orde van Nederlandse Raadgevende Ingenieurs

New Zealand

The Association of Consulting Engineers, New Zealand

Nigeria

Association of Consulting Engineers, Nigeria

Norway

Radgivende Ingeniørers Forening

Singapore

Association of Consulting Engineers, Singapore

South Africa

*The South African Association of Consulting Engineers
Die Suid Afrikaanse Vereniging van Raadgewende Ingenieurs*

Spain

Asociación Española de Consultores de Ingeniería

Sweden

Svenska Konsulterande Ingenjörers Forening

Switzerland

*Association Suisse des Ingénieurs-Conseils
Schweizerischer Verband Beratender Ingenieure*

United Kingdom

The Association of Consulting Engineers

United States of America

American Consulting Engineers' Council

Zimbabwe

The Association of Consulting Engineers' of Central Africa

- b) *The International Development Association*
- c) *The United Nations Development Programme*
- d) *The United States Agency for International Development*

- e) *The United States Engineers' Council*
- f) *Civil Aviation Authorities of ICAO Member States*
- g) *Airport administrative bodies world-wide (names and addresses can be obtained from the "World Aviation Directory")*
- h) *The International Bank for Reconstruction and Development (World Bank)*
- i) *The Export-Import Bank*
- j) *The African Development Bank*
- k) *The Arab Development Bank*
- l) *The Asian Development Bank*
- m) *The Caribbean Development Bank*

CHAPTER 4.- CONTRACT PREPARATION

4.1 INTRODUCTION

4.1.1 This chapter describes the types of contracts generally used in the employment of consultants. Contracts for construction services are discussed in Chapter 7.

4.1.2 A draft of the proposed contract should be prepared and submitted for conditional approval and for comment and revision to all organizations whose final approval or participation will be required. This draft contract should be provided to the selected consultant to afford him the opportunity to study the terms, discuss his detailed financial proposals and develop alternatives which are beneficial to the sponsor and/or the conduct of the work. Following any negotiations with the selected consultant, any new terms agreed upon between sponsor and consultant must be resubmitted to the concerned organizations for final approval.

4.2 CONTRACT TYPE (FEE BASIS)

4.2.1 There are four basic contract types in general use insofar as the method of determining consultants' fees is concerned:

- a) *salary cost times a multiplier, plus direct, non-salary expense;*
- b) *cost plus a fixed payment;*
- c) *fixed lump sum payment; and*
- d) *percentage of construction cost.*

Each type is described in the following paragraphs.

4.2.2 While any of the above-mentioned fee bases can be used in a consultancy contract, logic dictates that certain contract types are more appropriate than others for any specific task. Among the factors that enter into this logic are the following:

- a) *the degree to which the scope of work can be defined;*
- b) *the degree to which the duration of work can be defined;*
and
- c) *the sponsor's staffing requirement for administration and audit for each type of contract.*

4.2.3 While logic may favour a particular type of contract, the limitations which may be imposed by law, usual standard practices or by outside lending agencies, could govern the type of contract to be used. Should none of these factors be present, the

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.

5.7 TIMING AND LOCATION

5.7.1 The timing of negotiations should be determined on the basis of the available time between selection of the consultant and required start of work. Among the considerations in determining the date for start of the negotiations are:

- a) *anticipated duration of negotiations;*
- b) *anticipated probability of reaching agreement with selected consultant and time loss if agreement is not reached;*
- c) *time required to obtain necessary approvals; and*
- d) *time required for consultant's mobilization for project.*

5.7.2 Except for pre-negotiation meetings which may be desirable and which may be requested by the consultant, there is no substantial advantage in starting negotiations earlier than the date which accommodates the above-mentioned considerations with some margin of safety.

5.7.3 The negotiations can be conducted at any location of convenient access by all parties. The sponsor's offices are generally acceptable provided that they afford the consultant adequate communication facilities (telephone-telex) with his home office. The availability of communication facilities is important since the number of people conducting the negotiations for the consultant is normally small to minimize cost and expedite discussion.

5.8 RECORD OF NEGOTIATIONS

5.8.1 The negotiations provide a fuller insight to the intent of the parties than can ever be expressed in formal contract language. Statements made, positions taken and promises made by either party during the negotiations should be and generally are taken at face value by the other party, thus influencing the position and decisions of the other party. It is, however, a fact that in many projects the participants in the negotiations are not available when certain points are disputed in the future or that their memories are not complete. It is, therefore, imperative that a complete record of the negotiations be kept. Moreover, the pertinent decisions and agreements reached in each day's negotiation should be transcribed and distributed on a daily basis for the verification by each party to the negotiations. Any exception to these minutes by either side should be the first item of discussion at the next negotiating session and any necessary corrections entered into the record.

5.9 REVISION AND AWARD OF CONTRACT

5.9.1 The draft contract which served as the basis for negotiation should be revised to reflect any modifications, deletions and additions as agreed upon in the negotiations. The final contract documents should be re-examined by both the parties to be sure that the final wording is the true intent of both parties and does not contradict the record of the negotiations. Simultaneously, they should be submitted to all agencies whose approval is required. Should any disagreements arise, they should be resolved and the contract amended, signed and awarded. A clause should also be included in the final contract designating the record of the negotiations as a binding part of the contract.

CHAPTER 6.- CONTRACT ADMINISTRATION

6.1 INTRODUCTION

6.1.1 Successful contract administration is dependent on the development of an organization to monitor and control every aspect of the project, staffed by people competent in their individual fields and with the willingness and ability to co-ordinate and co-operate with other members of the staff, the consultant, and representatives of other organizations involved in the project.

6.1.2 A good organization requires good communication both internally and externally. It is essential that each person involved know the full extent of his responsibilities and the limit of his authority. The sponsor should provide the consultant with a copy of his table of organization, including a description of the responsibility and authority of the key staff members with whom the consultant will have contact. The sponsor should receive a similar list from the consultant.

6.1.3 All formal meetings between the sponsor and the consultant should be confined to the least number of people required to discuss the subject(s) of the meeting. A record of each meeting should be prepared and distributed to all participants. The foregoing is not intended to discourage informal meetings of members of each staff to discuss technical aspects of the project. Such discussions among appropriate staff members is usually beneficial and should be encouraged to the maximum extent possible. Such meetings should not be recorded so as to permit a free flow of ideas to be considered on an informal basis. Experience has shown that such an exchange of views often results in a much clearer understanding on the part of both the consultant and the sponsor of the underlying needs to be fulfilled by the project with the result that the final project produced is of a higher quality. Further, such informal discussion usually promotes review of the work as it proceeds which reduces the time necessary for formal review at each step in the project development. It also precludes the possibility that work which is unsatisfactory will have progressed too far undetected resulting in unnecessary time and expense to reaccomplish it in an acceptable manner.

6.1.4 The overall responsibilities of the sponsor's organization are usually much broader in scope than the administration of a contract awarded to a single consultant. It is beyond the intent of this manual, however, to attempt to provide guidelines for the formation and operation of an organization to discharge these broader responsibilities. This chapter is concerned only with administration of a consultant's contract.

6.2 METHOD OF ADMINISTRATION

6.2.1 This is ordinarily accomplished in one of three ways, or in some cases, by combining features of each.

- a) *by incorporating the administrative functions for this contract into the responsibilities of the overall organization;*
- b) *by creating a task force team dedicated to the administration of this contract and relieved of other responsibilities. This task force may contain some personnel specifically hired for the project but the leadership should be appointed from within the sponsor's existing organization; and*
- c) *by employing an outside consultant to perform some or all of the functions as discussed in 1.7.4 through 1.7.9.*

6.2.2 Several factors influence the choice of administration method:

- a) *the operational characteristics of the sponsor's existing organization;*
- b) *the current activities of the sponsor's staff and their availability and capability to accommodate additional workload;*
- c) *the magnitude and complexity of the contract to be administered;*
- d) *the number, size and complexity of associated and/or similar contracts;*
- e) *whether or not the sponsor has a continuing programme following the project completion to justify a permanent increase in staff size; and*
- f) *the level of experience that the sponsor's organization has with contracts of this type.*

6.2.3 Any of the three methods of providing a contract administration staff, outlined above, can be utilized and have proven satisfactory. The decision as to which method to use rests with the official within the sponsor's organization charged with the responsibility of contract administration and should be made on the basis of the factors described above and any others which may have a bearing on the final decision.

6.3 ORGANIZATION STRUCTURE

6.3.1 There are three primary categories of work to be accomplished by the sponsor's staff in connexion with contract administration:

- a) *administrative;*
- b) *technical; and*
- c) *legal.*

The first two are sometimes combined within the organizational structure, however, they are distinctly different aspects of contract administration and for the purpose of this discussion will be treated separately. The third, legal, because of its special nature and the need for specific professional qualifications is seldom, if ever, combined with the other two functions. Generally, the sponsoring organization has its own legal staff or has access to the legal staff of the parent organization and this staff has responsibility for deciding legal questions referred by the administrative and technical staff. Except on very large projects, the legal aspects of a particular project would not occupy a staff member full time and, therefore, normally, the legal staff member assigned to monitor the project would be handling a number of projects. The three categories of work are discussed below.

6.3.2 Administrative. The purely administrative function, especially the leadership, should be accomplished by competent, experienced administrators. It is, of course, advantageous if these individuals also have technical and/or airport background experience. However, competency in administration of contracts is more important than other experience, provided that there is a competent technical staff to provide back-up.

6.3.3 Technical. The technical department will, of course, vary in size and diversity of experience in accordance with the size and complexity of the contract. Insofar as possible, the individuals who participated in the determination of the scope of work for the contract and have, thereby, an appreciation of the project as a whole and the various design interfaces, should be utilized in the technical aspects of contract administration.

6.3.4 Legal. In general, the function of the legal department is to provide advice to the contract administrator, particularly in the handling of disputes and in the preparation of revisions to the contract. The legal department, as previously discussed, is ordinarily a separate entity, not a full time part of the overall contract administration staff. Continuous familiarity with the progress of the work and all correspondence connected with the project that is not purely technical in nature should, however, be maintained.

6.4 CO-ORDINATION

6.4.1 Airport and airport-related design and construction involve the co-operation and agreement of many organizations in addition to the sponsor, consultant and contractor. These organizations may include:

- National Aviation Authority*
- National Air Force*
- International Civil Aviation Organization*
- National and International Airlines*
- Ministry of Communications*
- Ministry of Public Works*
- Ministry of Transportation*
- Environmental Agency*
- Local Utility Companies*
- Lending Agencies*

6.4.2 Other organizations may also be involved depending on the governmental and legal framework under which the project is to be designed and constructed. When the project is large and important, the press, local community governments and organizations and proximate land owners will also wish to be consulted and perhaps offer suggestions and/or objections to the project or some of its components.

6.4.3 Co-ordination can impose a difficult burden on the administrative staff. However, it is generally true that the greatest degree of co-operation will be achieved by the fullest possible dissemination of information to all concerned.

6.5 ADMINISTRATION FUNCTIONS

6.5.1 Workload administration functions involve considerable interplay between the technical and administrative departments, with some input from the legal department. The workload is dependent on several factors:

- a) *the size and complexity of the project;*
- b) *the type and contract under which the consultant is employed and the specific terms of that contract;*
- c) *the requirements of the lending agency;*
- d) *the requirements of national and international aviation agencies; and*
- e) *the location where the work is being accomplished.*

6.5.2 Technical review

6.5.2.1 It is reasonably safe to assume that having employed an experienced consultant, his planners, architects and engineers will produce a level of design that is technically correct. There will also be a further check on the technical correctness made by the construction contractor before and during the construction. Therefore, a detailed point by point or computation by computation check by the sponsor's staff is usually not warranted.

6.5.2.2 Certain features of the planning and design, however, should be carefully reviewed, among which are:

- a) *Is the design functional and economical?*
- b) *Does it meet applicable building and construction codes?*
- c) *Are the type of construction and materials suitable? Are local resources, materials and equipment used where advantageous?*
- d) *Can the facility be constructed by local labour forces, equipment and methods?*
- e) *Is the degree of detail in plans and specifications sufficient for construction?*

f) *Are the interfaces with other contracts correct?*

g) *Is the estimated construction cost within the budget?*

6.5.2.3 The most effective technical review is conducted on a frequent (but not continuous) basis. That is to say the reviewers make regular, but informal, visits to the consultant's office to examine the work in progress. This is not always possible such as in the case where some or all of the work is being performed outside of the sponsor's State. When such is the case, periodic visits to the consultant's office should be scheduled at appropriate points during each phase of the project. The number of visits scheduled would, of course, have to be consistent with the need to perform contract administration in an economical fashion and the time and expenses in connexion with such trips would have to be reflected in both the sponsor's and consultant's budget for accomplishment of the work. Nevertheless, the importance of these meetings cannot be overemphasized since they prevent the consultant from proceeding far along on a basis which is unacceptable or undesirable to the sponsor, and also minimize the amount of time which will be required for formal reviews at the completion of each phase of the consultant's work.

6.5.2.4 It must be accepted that both the sponsor and the consultant are primarily concerned with achieving the best possible design at the least possible cost. Each party approaches these goals from a perspective based on his own experience. The consultant, therefore, should be given every opportunity to explain the logic of his design before changes are imposed. If, after such explanation, the sponsor believes that changes must be made, such revisions should be requested in writing.

6.5.3 Contract compliance review

6.5.3.1 This review should be carried out periodically to ensure that the consultant is in compliance with all the contract provisions, general and special, including compliance with all applicable national and local laws and regulations governing the conduct of his work.

6.5.3.2 At the beginning of the project, the consultant will propose methods to satisfy the sponsor's requirements with regard to procedures and record format. These should be reviewed in a timely fashion and the consultant notified of any additional requirements.

6.5.3.3 Contracts are of necessity written in legal language which is intended to protect the interests of both parties. It is important to the smooth conduct of the work that contract compliance reviews should consider the spirit and intent of the contract provisions rather than the narrow "letter of the law".

6.5.4 Schedule and manpower review

6.5.4.1 In his proposal and in the course of the negotiations, the consultant will have presented or have agreed to a schedule for the conduct of the work and the manpower requirements estimated to accomplish it. The progress of the work should be reviewed frequently, at least monthly. If there are indications that the consultant is falling behind in accomplishing critical elements of the work, he should be informed of this and requested to take corrective measures.

6.5.4.2 The situation may arise wherein the sponsor believes that an increase in manpower or change of personnel is required. Such requests should be carefully considered and the subject should first be discussed with the consultant. If after discussion the sponsor is convinced that such action is necessary, the consultant should be so directed with the advice of the sponsor's legal department.

6.5.4.3 Not all elements of the consultant's task are on the critical path for completion of the project. The degree of insistence on meeting schedules should take into account the criticality of the work which is or shows indications of falling behind schedule.

6.5.5 Invoice review and approval - periodic payments

6.5.5.1 No contract can be performed without difficulties if the consultant is not paid on time (in both foreign and local currencies) and the sponsor should recognize the necessity of prompt payment. The initial expenses of the consultant are generally high, and down-payments or advances at the start of the services are frequently provided for in the contract and should be promptly paid by the sponsor. To ensure prompt payment to the consultant, the sponsor should designate a member of his staff as responsible for administration of payments and other financial aspects of the contract. Frequently, the use of standard forms will help to expedite payment. The sponsor representative and the consultant representative should review in detail the format and procedures governing the preparation of invoices prior to submitting the first invoice, thus permitting the sponsor to process the invoices through his organization without delay. If letter-of-credit arrangements are used, their validity should extend long enough and their face amount be large enough, so that frequent time extensions and enhancements of face amount are unnecessary.

6.5.5.2 Whenever the sponsor considers items included in the consultant's invoices to be questionable for any reason, he should provide the consultant with a complete explanation of all amounts disallowed and should then proceed with payment of the balance of the invoice. As a matter of equity, payment of an entire invoice should not be delayed because some items are in question.

6.5.5.3 Processing of invoices in a responsible manner contributes to the efficiency of the accomplishment of the work and reduces the time and hence the cost involved in administering the contract for both the consultant and the sponsor.

6.5.6 Final acceptance and payment

6.5.6.1 Assuming that the contract administration has been performed during the programme, in a timely fashion, the final acceptance and payment would simply consist of the consultant's final submission of the plans and other documents required under the terms of contract and the processing and payment of the final invoice. Depending on the magnitude of the contract, it is often the case, however, that the consultant will have outstanding bills for out-of-pocket expenses for which he has not as yet received receipted bills required to substantiate such expenses when invoices are submitted. For this reason, it is not unusual for some additional charges to be submitted after the work product has been finally delivered. These charges are usually relatively minor in comparison to the overall costs. Nevertheless, they are legitimate expenses incurred by the consultant which must be reimbursed.

6.5.6.2 To accommodate this necessity, a time period beyond the final submittal date for the work performed, is usually specified in the contract. This period will, of course, vary depending on the magnitude of the work. However, because of the reasons outlined above, 90 days is considered a minimum for this purpose. This time period also allows time for the sponsor to complete his review of the work and documents submitted to ensure their completeness in all respects.

6.5.6.3 Nevertheless, it is advantageous for both the sponsor and the consultant to adhere to the time period specified in the contract to close out the project. If this time period is permitted to extend, both the sponsor and the consultant will incur costs which have not been envisioned because of the necessity of maintaining staff which would not be fully occupied for the extended period.

6.5.6.4 At the expiration of the specified close out period, the consultant should be required to submit a final invoice with the understanding that further charges will not be accepted. The sponsor on the other hand, concurrent with the issuance of the final payment, should issue a formal statement of final acceptance, indicating that all work in connexion with the contract has been completed and accepted and no further obligations exist.

6.6 REVISIONS TO THE SCOPE OF WORK

6.6.1 Revisions to the scope of work frequently prove desirable as the work progresses. These revisions may be additions, subtractions or modifications. The original contract ordinarily contains provisions regarding the methods by which such revisions are accomplished and the mechanism by which the increase or decrease in fee is negotiated and determined.

6.6.2 Any revisions which exceed the provisions contained in the contract, particularly increases to the scope of work, involve the same procedures as discussed in the previous chapters, obviously omitting the solicitation and selection functions.

6.6.3 The consultant should be requested to make a proposal, both technical and financial, on the new scope. The fee basis for the additional work need not be the same as in the original contract.

6.6.4 The original negotiations will serve as a basis for the negotiations on the revisions to the scope of work. Recognition must be given, however, to the experience gained in the progress of the work preceding the proposed revisions and conditions which may have changed since the original award of contract.

6.7 SETTLEMENT OF DISPUTES

6.7.1 The contract should set forth the process by which disputes between the sponsor and the consultant are to be settled if they cannot arrive at a mutually satisfactory agreement between themselves. Every effort should be made to resolve disputes as soon as possible without outside assistance or interference since such outside involvement is usually costly, time-consuming, and perhaps most importantly, destructive of rapport between the sponsor and the consultant. This rapport is essential to the smooth conduct of the project.

6.7.2 The type of dispute referred to above is concerned with money. There are other disputes which may arise concerning the design. These may involve the design, per se or the degree of detail which is provided in the plans and specifications.

6.7.3 Regarding the design, per se, most difficulties are avoidable if there is frequent or continual review by the sponsor during the design process. This diminishes the possibility for the consultant to invest large amounts of time and effort in designs that are not satisfactory to the sponsor. The sponsor should be the final judge of what he wants as long as it does not violate engineering or architectural principles, or exceed the scope of the contract.

6.7.4 Disputes regarding the degree of detail to be provided in the plans and specifications can be avoided if a carefully thought-out description of the desired degree of detail is incorporated into the contract language.

CHAPTER 7.- CONSTRUCTION CONTRACTS

7.1 INTRODUCTION

7.1.1 The scope of work of a construction contract is normally defined by detailed plans and specifications. The guidance provided in this manual is predicated on that basis, however, much of the material is applicable, with some modification, to alternative means of accomplishing a construction programme.

7.1.2 Circumstances which might give rise to the use of alternative means are cases wherein an emergency dictates the need for immediate construction or an instance when the requirement for occupancy or use of a facility is so urgent that time is simply unavailable to employ the normal procedures.

7.1.3 Construction contracts involve sums of money much larger than the costs of the design. For this reason, the outcome of competitive price bidding is the primary basis for selection of the construction contractor. In contracting for consulting services, experience and the record of past performance should be the main criteria for selection. They are also factors to be considered in selecting a construction contractor; how great a factor is related to the strength of the sponsor's supervisory and control staff during construction.

7.1.4 There are many methods that may be employed to reduce the normal time required for design and construction. These are far too numerous to be discussed within the context of this manual. All involve retaining the construction contractor prior to completion of design. Due to the overlapping of design and construction in these circumstances, the management of the work is much more complex requiring more co-ordination and staff for the consultant, construction contractor and sponsor.

7.2 CONTRACT TYPES AND PROCEDURES

7.2.1 There are four basic types of contracts commonly employed in construction:

- a) *unit price;*
- b) *lump sum;*
- c) *cost plus a fixed fee; and*
- d) *cost plus a percentage of cost.*

7.2.2 Unit price contract

7.2.2.1 The unit price contract affords the best opportunity for cost control. It requires the sponsor's staff to make or verify measurements of quantities on a continuing basis to justify periodic and final payments, in addition to the normal supervisory and administrative staff. Care must be taken in defining the pay items to minimize the number and type of measurements while maintaining a true gauge of accomplishment.

7.2.2.2 The unit prices which the bidder proposes are based on the quantities shown in the plans and contract documents. A unit price contract should contain wording covering the method of determining a revised unit price for substantial increases or decreases in any particular pay item due to design changes during construction or elimination or addition of elements of construction. Normally the overall project costs are permitted to vary by plus or minus 15 per cent without a revision to the contract.

7.2.3 Lump-sum contract

7.2.3.1 Lump-sum contracts are probably the easiest to monitor and administer, provided that the plans and specifications are complete and well detailed. If the plans are not extremely explicit and the possibility exists for interpretation or choice, it is only logical to assume that the contractor will follow the course most profitable to him and this could give rise to disputes.

7.2.3.2 Lump-sum contracts should establish unit prices for each item of work to provide a basis for adjustments to the lump sum arising from revisions to the plans during construction or elimination or addition of work. The unit prices apply only in such cases and cannot be substituted for the fixed lump sum agreed for the original plans.

7.2.4 Cost plus a fixed fee contract

7.2.4.1 This type of contract is usually employed when there is a necessity to start construction before all the plans have been completed but the overall magnitude of the project has been established. Contract terms must be carefully prepared to ensure that the sponsor maintains sufficient control over labour rates and the purchase of materials and equipment to result in economical construction without placing unreasonable restraints and delays on the contractor.

7.2.5 Cost plus a percentage of construction costs contract

7.2.5.1 This type of contract is similar to the cost plus a fixed fee contract. It can, however, be employed before the overall magnitude of the project has been established. It is not unusual for the agreement to provide for a diminishing percentage as increments of work are added to the original scope.

7.3 COMPETITIVE BIDDING

7.3.1 The practice of awarding contracts for construction on the basis of competitive proposals is one of long standing. Such bidding has the purpose of affording to construction contractors adequate notification of a sponsor's requirements and of providing all bidders an equal opportunity to obtain a contract for the work. Detailed engineering of the project to be constructed including the preparation of technical specifications and other bidding documents precedes the invitation to bid for the contract. The preparation of these documents ensures that the contractor will deliver, in full compliance with the sponsor's requirements, without misunderstanding or unexpected cost, a project adequate for its intended purpose. The information shown and described in the contract documents must be sufficient to enable the contractor to prepare complete and accurate estimates.

7.4 ADVERTISING

7.4.1 The best interests of the project are served by the widest dissemination possible of bidding documents. The international community should be notified of the details of the project and the opportunity of bidding. Normally this is accomplished by advertisement of the bidding opportunity in newspapers of general circulation in the sponsor's country and in the case of large contracts in well known technical magazines and trade publications of wide international circulation. These advertisements should be published in sufficient time before bids are to be opened to enable prospective bidders to request bidding documents and prepare bids. Advertisements should contain a brief description of the project to be constructed and the name and address of the agency or official within the sponsor's organization to be contacted for further information. In the case of projects which are financed in whole or in part by international loans it should be noted that all lending agencies providing funds for large projects have established policies concerning the required extent of advertising for bids from contractors. In general, invitations for bid or pre-qualification should be transmitted to local official representatives of all States designated by the lending agency or to the foreign offices of those States. Advertisements should also be placed in widely circulated technical magazines and trade publications.

7.4.2 The advertisement of the project for the purpose of soliciting the interest of contractors should contain as a minimum:

- a) *a brief description of the project including its location and the construction services required;*
- b) *the type of contract contemplated (e.g. lump sum);*
- c) *the estimated date when invitations for bids will be issued, bid closing date and starting and completion dates of construction services;*
- d) *a statement of the currencies in which the contractor will be paid with some indication of which categories of services will be payable in each currency;*
- e) *the address from which interested firms may obtain further information; and*
- f) *a statement of the qualifications required for bidders (satisfactory experience on projects of similar kind and size; financial capacity; availability of necessary manpower and equipment).*

7.5 PRE-QUALIFICATION

7.5.1 Pre-qualification of bidders is not absolutely mandatory but for large or complex contracts it is normally advisable to confine the bidding to only those firms that have proven capability.

7.5.2 Pre-qualification should be based entirely on ability to perform satisfactorily, taking into account:

a) *applicable experience in:*

- 1) *handling contracts of comparable size, complexity, and technical specialty;*
- 2) *performing the particular kinds and specialties of services required; and*
- 3) *performing overseas contracts not necessarily in the sponsor's country, including experience in dealing with firms and personnel, and in working under conditions such as exist in the sponsor's country.*

b) *reputation, covering:*

- 1) *overall professional reputation, particularly for services of the character required;*
- 2) *known cases of prior performance, including quality of work, maintenance of schedules, and cost of services; and*
- 3) *the firm's known relationship with its clients, including the extent of litigation or other disputes arising out of its contracts.*

c) *job capacity, covering:*

- 1) *intention and ability to assign efficient qualified personnel, including technicians in the specialties required, and experienced and qualified supervisory personnel, preferably from its own organization;*
- 2) *intention and ability to perform the contract primarily with its own staff, rather than through subcontractors;*
- 3) *the workload of the firm under current contracts relative to its local strength;*
- 4) *the firm's capacity to start work promptly;*
- 5) *the firm's ability to furnish or procure required materials, equipment, or specialized services, if any, and the qualifications of any proposed subcontractors;*

- 6) *the firm's ability to deal with local personnel and agencies in the country where services are to be performed on technical and administrative matters, including the ability of its personnel to use the local language; and*
- 7) *a showing of adequate financial strength of the firm.*

7.5.3 Abbreviated specifications should be made available to contractors desiring to be considered for qualification. When pre-qualification is employed all firms found to be qualified should be permitted to bid.

7.6 BIDDING DOCUMENTS

7.6.1 The bidding documents should furnish all information necessary for a bidder to prepare a responsive offer. These documents should include:

- a) *instructions to bidders;*
- b) *bid form;*
- c) *the proposed contract between the sponsor and the contractor;*
- d) *the general conditions of the contract;*
- e) *special conditions of the contract;*
- f) *the drawings; and*
- g) *the specifications as well as any necessary appendices.*

7.6.2 The cost of providing copies of plans, specifications and other documents to potential bidders can be considerable. To ensure that contractors are truly sincere in their desire to bid on the project, it is usual to request that a sum of money, commensurate with the cost of preparing the documents, be deposited with the sponsor then returned to unsuccessful bidders on return of the documents.

7.7 INSTRUCTIONS TO BIDDERS

7.7.1 The notice and instruction to prospective bidders should include as appropriate the following:

- a) *the address where and the date and time when sealed bids will be opened and the closing date and time for receipt of bids;*
- b) *a general description of the project;*

- c) *the requirements for the amounts of bid, performance and payment bonds or guarantees. The proceeds of these should be payable to the sponsor and the period the bid and bid bond shall remain firm and binding should be specified. Bid bonds or guarantees should not be set so high as to discourage suitable bidders and should be released to unsuccessful bidders as soon as possible after it is determined that they will not be awarded the contract;*
- d) *an indication of the portion of construction services which will be paid in local currency and that which will be paid in foreign currency, and the conversion rate between currencies which will be used to compare bids should also be specified;*
- e) *a statement that bidders' failure to visit the site of the project and to familiarize themselves with the nature of the work and local conditions which may affect the cost of the work will not relieve bidders from responsibility for properly estimating the cost of performing the work;*
- f) *if pre-qualification has not been required, enumeration of those items of information which bidders must furnish to establish their qualifications and a statement of the right of the sponsor to reject any firm not qualified in the sole judgement of the sponsor; and*
- g) *a statement that the contract shall be awarded to the lowest qualified and responsive bidder and that the sponsor shall reject any bid that is unresponsive and may also reject all bids.*

7.8 BID FORM

7.8.1 The bid form should include provision for:

- a) *the bidder's acknowledgement of receipt of the complete contract documents and all addenda;*
- b) *the bidder's offer to perform the work described in the contract documents as specified for the amount in local and other currencies separately stated and totalled as set forth by the bidder in the bid form and any accompanying schedule; and*
- c) *the bidder's undertaking that upon written notification of award and acceptance of its bid by the sponsor that it will, within a specified time, furnish such performance and payment bonds or guarantees as are required by the contract documents and execute a formal contract with the sponsor in the form included in the contract documents.*

7.9 CONSTRUCTION CONTRACT

7.9.1 The contract for construction services is the formal document signed by the successful bidder and the sponsor by which the successful bidder agrees to perform the work described in the contract documents for the amounts set forth on the bid form. The contract should satisfactorily set out the contractual relations. The individual clauses of the contract which are applicable will depend on the type of project, local statutory requirements and other variables. Guidelines on particularly critical components of the contract are described in the following paragraphs.

- a) *The contract should clearly define the scope of work to be performed and the rights and obligations of the sponsor, the contractor and the powers and authority of the personnel administering the contract.*
- b) *The number, type and frequency of reports to be submitted by the contractor to the sponsor should be specified and the language in which the reports are to be written.*
- c) *The types and terms of insurance to be provided for loss or damage to the work in progress and against claims by third parties for damages arising out of contract performance should be clearly stated.*
- d) *The extent of financial liability, exemption or immunity of the contractor and its personnel for taxes, customs and duties imposed by the sponsor should be clearly stated.*
- e) *It should be stipulated that the failure on the part of the parties to perform their obligations under the contract would not be considered a default if such failure is the result of an event of force majeure as defined in the conditions of contract.*
- f) *Procedures should be established for the settlement of disputes and the method of appeal for any decision on such a dispute including applicable law and forum. Experience indicates that provision for arbitration of disputes by an impartial body has certain practical advantages over other dispute-settling methods.*
- g) *The contract should specify the conditions and mechanics of payment and the currency in which payments will be made. Where applicable, provision should be made for the conversion by the contractor of the sponsor's currency into foreign currencies as required. The contract should also provide against a loss or gain to the contractor from a variation in exchange rates.*

- h) Where applicable any advance payment upon signature of the contract for mobilization and similar expenses should be related to the estimated cost of these items. Other advances to be made, for example, for materials delivered to the site for incorporation in the work, should be clearly described and should include terms of any security required for advance payments.*
- i) The contract should contain a clear statement whether prices are subject to adjustment. The use of a comprehensive price adjustment formula related to basic price indices is the usually preferred method of providing for such adjustment.*
- j) When time of performance is important, clauses providing for liquidated damages of specified reasonable amounts in the event performance is not completed by a stipulated date should be included in the contract. Provision may also be made for a bonus to be paid to contractors for completion of contracts ahead of the time specified in the contract.*

7.9.2 The International Federation of Consulting Engineers (FIDIC) has published several documents which provide complete sample contracts for construction contracts. These documents have the approval of numerous national, regional, and international associations of contractors. Among the documents of particular interest to sponsors of aviation related projects are:

- a) Conditions of Contract (International) for Works of Civil Engineering Construction; and*
- b) Conditions of Contract (International) for Electrical and Mechanical Works.*

These documents have not been reproduced in this Manual. They are available from FIDIC or its associated organizations, which are listed in Chapter 3 of this Manual.

7.10 PLANS, DRAWINGS AND SPECIFICATIONS

7.10.1 The plans, drawings and specifications must be complete, consistent with project requirements, display an appropriate level of design and be prepared in such a manner as to set forth as clearly and precisely as possible the work to be accomplished. The principle objective is to eliminate ambiguity and encourage maximum competition among the firms bidding. Drawings should be fully co-ordinated and consistent with the text of the specifications. The tests, standards and methods that will be employed to judge conformity of the work performed with the specifications should be clearly defined. Specifications should be based on performance requirements and references to brand names should be avoided as far as possible. If it becomes necessary to quote a brand name of a particular manufacturer to clarify a specification, the words "or equivalent" should be added after the brand name. The specification should permit the acceptance of offers for alternative equipment which have similar characteristics and which provide performance and quality at least equal to those specified. Alternatives would not be acceptable when standardization is sought, or because the need for spare parts and maintenance service cannot be met.

7.11 BID OPENING EVALUATION AND AWARD

7.11.1 The basis for competitive bidding will have been clearly established in the instructions to bidders to ensure that there is a clear cut method of comparison of the bids that are received. This is a relatively simple process in unit price contracts; the sponsor provides a list of pay items and quantities of each to which each bidder applies prices. Where a different type of contract is employed, the process is more complex. In these cases the bidding should be broken down into units commensurate with the size and complexity of the project.

7.11.2 During the bidding process, it is extremely important that any communication, verbal or written, with any bidder on the project which provides additional information or understanding regarding the project also be communicated to all other bidders.

7.11.3 The time allowed for preparation of bids will depend to a large extent upon the magnitude and complexity of the contract involved and the remoteness of the project from areas from which bids may be expected. Where large civil works are involved, generally about 90 days should be allowed for contractors to conduct investigations at the site. The time allowed, however, should be governed by the circumstances relating to each project.

7.11.4 The date, hour and place of bid opening should be announced in the invitations and all bids should be opened publicly at the stipulated time. Bids received after this time should be returned unopened. The amounts of each bid should be read aloud and recorded.

7.11.5 No bidder should be permitted to alter his bid after the bids have been opened. Only clarifications not changing the substance of the bid may be accepted. The sponsor may ask any bidder for a clarification of his bid but should not ask any bidder to change the substance of his bid.

7.11.6 Except as may be required by law, no information relating to the examination, clarification and evaluation of bids and recommendations concerning awards should be communicated after the public opening of bids to any persons not officially concerned with these procedures before the announcement of the award of a contract to the successful bidder.

7.11.7 Following the opening, it should be ascertained whether:

- a) material errors in computation have been made in the bids;*
- b) the bids are fully responsive to the terms of the specifications;*
- c) the required guarantees and sureties have been provided;*
- d) documents have been properly signed; and*
- e) the bids are otherwise generally in order.*

If a bid does not substantially conform to the specifications or is not otherwise substantially responsive to the invitation, it should be rejected. A technical analysis should then be made to evaluate each responsive bid and to enable bids to be compared.

7.11.8 Bid evaluations should be consistent with the terms and conditions set forth in the specifications and any modifications thereof prior to the opening of bids. For the purpose of determining the lowest evaluated bid, factors other than price, such as the time of completion of construction, operating costs, the efficiency and reliability of the equipment, the time of its delivery and the availability of service and spare parts, should also be taken into consideration if applicable (whenever possible, being expressed in monetary terms according to the basis given in the specifications).

7.11.9 In the absence of pre-qualification, the sponsor should determine whether the bidder whose bid has been evaluated the lowest has the technical capability and financial resources to effectively carry out the contract concerned. If the bidder does not meet that test, his bid should be rejected.

7.11.10 Ordinarily, the award of a contract should be made to the bidder whose bid has been determined to be the lowest evaluated bid and who meets the appropriate standards of technical capability and financial resources. Such bidder should not be required, as a condition of award, to undertake responsibilities or work not stipulated in the specifications or to modify his bid price. There are, however, circumstances, for example a low bid which is unbalanced in the relative costs for its components, which might indicate that the next lowest bidder is a more desirable contractor.

7.11.11 The laws of each State and the requirements of the lending agencies are not uniform regarding the requirement for awarding the contract to the apparent low bidder. The sponsor should seek legal advice before awarding a contract to a contractor who is not the low bidder, even when there are good and logical reasons for doing so.

7.11.12 Bidding documents usually provide that owners may reject all bids. Such rejection is justified where bids do not meet the intent of the specifications or where there is evidence of lack of competition. New bids solely for reasons of price should normally not be invited. However, sponsor may reject all bids if the lower bids exceed the cost estimates by an amount sufficient to provide a reasonable justification for such action. In such cases, new bids should be requested from at least all who were invited to submit bids in the first instance and a reasonable amount of time should be allowed for the submission of the new bids.

7.12 CONSTRUCTION MANAGEMENT AND CONTRACT ADMINISTRATION

7.12.1 Once a contract has been awarded the contractor mobilizes and construction commences in accordance with the drawings and specifications prepared for the project. Personnel who represent the sponsor either from his own staff or through the services of a firm hired for this purpose must be assigned to the site to observe and monitor construction and administer the contract. The goal of this staff is to ensure that the construction results in a quality project with all work performed in strict conformance with the requirements of the drawings and specifications. The contract is a legal commitment to accomplish the work in a specified manner within a specified time frame. The sponsors field personnel do not have authority to change the terms of the contract. Their responsibility is to ensure that all work is accomplished in accordance with the intent of the contract.

7.12.2 The relationship between the contractor and the sponsor's representative is of paramount importance. The contractor is a professional in his field of endeavour and will seek to accomplish the work as efficiently and economically as possible. The sponsor's field force should understand the purpose and function of the completed work and should ensure that the project is built in accordance with the intent of the contract documents. The relationship with the contractor should be businesslike, fair and friendly. However, it should be entirely clear that only quality work is acceptable. A thorough knowledge of the drawings and specifications is essential to proper monitoring of the contractor's work. All personnel should be thoroughly familiar with these documents and refer to them frequently so as to be able to properly monitor construction activity.

7.12.3 The contract documents constitute the entire understanding between the sponsor and the contractor; there is no verbal understanding before or after the contract signing. Therefore, construction practice should not be governed by customary trade practice or any other such criteria. The specifications are based on long experience in the field on a diversity of projects, are practical and reasonable and their accurate interpretation is required to ensure quality, durable and maintenance-free construction.

7.12.4 Payments to the contractor should be processed promptly. This will require the sponsor's staff to perform necessary field measurements in a timely fashion and compute the necessary quantities. In the case where the contractor is required to submit an invoice, the sponsor's field staff should perform the necessary computations for checking the invoice prior to receipt of the invoice so as to permit immediate processing for payment. If discrepancies are found in the invoice, the contractor should be notified immediately and differences reconciled. Delay in the preparation and processing of payment should not be permitted to occur. The contractor is entitled to payment for his work in accordance with the contract. It is not only unfair to delay payment; it is a violation of the contract if payment is delayed after submission of a proper invoice. Payment of an entire invoice should not be delayed because of a discrepancy in a single item. The disputed item should be deducted and the remainder of the invoice processed for payment.

7.12.5 Maintaining adequate records is an important function of the sponsor's field staff. As a minimum, the records specifically required by the contract documents must be maintained. In addition, certain records will be required to cover unusual or special aspects of the project. The importance of good records cannot be over-emphasized. Inadequacy of records can be very costly in a major construction project. Promptness in entering records and preparing reports is fundamental. Memory of details may fade and a record prepared a significant time after the event lacks credibility. Reports required daily should be prepared on time and not permitted to slip. Correspondence is a vital part of every construction project. Communications should be answered promptly, and none should be left unanswered.

7.12.6 A job diary is absolutely essential and should be accurately maintained. The job diary will prove invaluable should a dispute arise at a later date. The diary should be kept in a bound book of adequate size. The work done each day should be recorded in general terms and any conversations with the contractor should be recorded in specific terms. Any unusual occurrences such as accidents, bracing or falsework failures, work stoppages, etc. should be entered in as much detail as possible. Diaries should be written in ink without erasures. If a mistake is made it should be struck out

and re-entered. Weather conditions should be entered for each day. The date of each placement of concrete should be recorded with the hour of start and finish, results of tests, and description of protection used against freezing or exposure to excessive heat.

7.12.7 In addition to the job diary, usually maintained by the sponsor's senior representative, other members of the resident staff should maintain records. The chief of survey is responsible for the maintenance of all surveying field books which should be preserved as official job reports. Any measurements relating to deviations from the contract plans should be promptly transposed to a record set of drawings for use in the preparation of "as-built" drawings.

7.12.8 Results of all soil tests, borings, compaction tests and pile records should also be carefully maintained as a record of the basis of acceptance of individual items of work. A daily record of men and equipment working on the site each day should also be kept. This can be compiled from the daily reports of the individual members of the staff assigned to the various sectors of the project.

7.12.9 In conclusion, it should be recognized that when the contractor and the sponsor's field force work as a team the result will be a quality construction project completed on time and with an adequate margin of profit for the contractor. At times the divergent perspectives of the contractor and the field force may cause a deterioration in this ideal relationship, however, senior members of each staff should strive to overcome disputes in a fair and reasonable manner and maintain businesslike but friendly relations throughout the course of the project.

7.13 CHANGES DURING CONSTRUCTION

7.13.1 There have been very few, if any, projects constructed that did not involve some changes in the original plans and/or specifications. These changes may arise from one or more circumstances, for example:

- a) *monetary restraints;*
- b) *unanticipated field conditions;*
- c) *revision of planning goals;*
- d) *correction of deficiencies or mistakes;*
- e) *non-availability of certain material or equipment; or*
- f) *development of improved construction methods.*

7.13.2 These changes may originate with either the sponsor, the contractor or the design consultant. All three parties must be involved in the implementation or rejection of proposed changes. Obviously, some change, not necessarily the one proposed, must be made in the case of b), d) or e) mentioned above.

7.13.3 Changes should not be implemented, however, without a thorough technical evaluation by a competent consultant and a cost vs. benefit analysis by the sponsor or his consultant.

7.13.4 The procedure for determining the payment for changes varies with the type of contract in effect. For unit price contracts, much of the cost will simply involve an addition or deduction to the original quantities, as long as the change does not exceed the limits specified in the contract. If the change involves removal of work already accomplished, that work will, of course, also have to be paid for. Changes made under lump sum contracts have to be negotiated on a case by case basis. Changes made under a cost plus percentage of cost contract or cost plus a fixed fee basis would require negotiation only if the change is significantly large.

7.13.5 Under any circumstances the contract should specify that the contractor must accept and implement changes even if agreement on cost cannot be reached prior to start of work on the changes.

CHAPTER 8.- SUMMARY

8.1 The foregoing text was prepared with only one purpose: to provide guidance to individuals and organizations in the process of contracting for consultant/construction services. The possible variation in type, size, complexity, location and method of project realization is far too great to permit a volume of this size to deal with more than generalities for most of the subjects covered. Specifics have been provided only for subjects which are usually not affected by the variations mentioned above. Even these should be examined carefully to be certain they are applicable.

8.2 The most significant steps for any project are:

- a) Task identification - the sponsor must identify what must be accomplished, the time frame for its completion, and the budget available for the work.
- b) Assembly of background material - the sponsor should research thoroughly all available data; physical, technical, statistical and socio-economic which will affect the magnitude and/or conduct of the work effort.
- c) Preparation of invitations for proposals - the degree of detail included in the invitations regarding the terms of reference, scope of work and contract conditions should be commensurate with the size and complexity of the project.
- d) Selection of consultant - this should be made on the basis of recent past accomplishments and reputation with comparative, competitive fees being a lesser consideration.
- e) Consultant contract type - unless law or other rules dictate otherwise, the type of contract (fee basis) should be a negotiable item and the type chosen should take into account the probability of future modifications to the scope of work and the easiest possible way to do this while minimizing the administrative burdens on both parties.
- f) Selection of contractor - this should be made on the basis of competitive bids after an examination of the bids for correctness, completeness and proper balance of individual unit prices. The contract type should be established by the sponsor taking into account the probability of future modifications to the scope of work.

- g) Negotiations - these should be conducted in a co-operative atmosphere with the willingness of each party to try to understand and accommodate the requirements of the other. The negotiation process will have a lasting effect on the conduct of the project.
- h) Contract administration - all the functions listed in the text must be carried out thoroughly and expeditiously; none more so than the prompt processing of invoices.

APPENDIX
STANDARD CONTRACT PROVISIONS

INTERNATIONAL GENERAL RULES OF AGREEMENT PART I STANDARD CONDITIONS

1 **GENERAL PROVISIONS**

1.1 **Scope of Services**

The services to be performed by the Consulting Engineer under this Agreement (hereinafter called 'the Services') are described in the Scope of Services set forth in Appendix A.

1.2 **Relationship between the Parties**

Nothing contained herein shall be construed as establishing or creating a relationship of master and servant or principal and agent.

1.3 **Language/s and Law**

There shall be stated in Part II of these International General Rules:

- (a) the language or languages in which the Agreement shall be drawn up;
- (b) the language according to which the Agreement is to be construed and interpreted, designated the 'Ruling Language';
- (c) the country or state, the law of which is to apply to the Agreement and according to which the Agreement is to be construed.

1.4 **Changes in Legislation**

If in the country in which the project is being carried out there should occur, subsequent to the date of this Agreement, changes to any National or State Statute, Ordinance, Decree or other Law or any regulation or by-law of any local or other duly constituted authority, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation or by-law which causes additional or decreased cost to the Consulting Engineer in the performance of his services, such additional or reduced cost shall be paid by or credited to the Client and the agreed remuneration adjusted accordingly.

1.5 **Definitions**

Words importing the singular only also include the plural and the masculine includes the feminine and vice-versa where the context requires. The word 'days' denotes calendar days.

1.6 Headings

The headings in these International General Rules of Agreement (Parts I and II) shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the Agreement.

1.7 Notices

All notices under this Agreement will be given in writing and will be deemed to have been given if delivered by one of the following means:

- personal delivery to the designated representative of each of the Parties;
- by telex;
- by telegram;
- by registered post

at the specific designation of the Parties as set forth in Part II of this Agreement.

2 COMMENCEMENT, COMPLETION, ALTERATION AND TERMINATION OF THE AGREEMENT

2.1 Agreement in Force

The Agreement is considered to have come into force immediately all the necessary signatures as stipulated in Part II of this Agreement have been appended.

2.2 Commencement Date

The Consulting Engineer shall commence the Services within the period stated in Part II of this Agreement.

2.3 Completion Date

The Services shall be completed within the period stated in Part II of this Agreement or as alternatively agreed in writing between both Parties.

2.4 Alterations

Should circumstances arise which call for modifications of the Agreement these may be made by mutual consent given in writing. Proposals in this respect from one party shall be given due consideration by the other party.

2.5 Assignment

The Consulting Engineer shall not, without the written consent of the Client, assign the benefits, other than the assignment of any monies due or to become due under this Agreement.

The Consulting Engineer shall not, without the written consent of the Client, in any way assign or transfer the obligations of this Agreement or any part thereof.

2.6 Death of the Client

The Agreement shall not be dissolved by the death or demise of the Client. His rights and obligations shall pass to his successors.

2.7 Partnerships

(i) Addition of Partner(s)

Should the Consulting Engineer be a partnership and at any time take an additional partner or partners he or they shall thence be deemed to be included in the expression 'the Consulting Engineer'.

(ii) Withdrawal of Partner(s)

Should the Consulting Engineer be a partnership the Agreement shall not be dissolved by the death or withdrawal of one or more members of the partnership.

2.8 Sub-Contracts

Any sub-contract or modification or termination thereof relating to the performance of the Services by the Consulting Engineer shall be made only with the advance written agreement of the Client.

2.9 Postponement and Termination

2.9.1 By Notice of the Client

The Client may by written notice to the Consulting Engineer at any time give prior notice of his intention to abandon the Services, in whole or in part, or terminate this Agreement. The effective date of termination of this Agreement shall not be less than sixty (60) days after receipt of such notice, or such other shorter or longer period as may be agreed between the Parties. Upon receipt of such notice the Consulting Engineer shall take immediate steps to bring the Services to a close and to reduce expenditures to a minimum.

2.9.2 Force Majeure

The Consulting Engineer shall promptly notify the Client, in writing, of any situation or event arising from circumstances beyond his control and which he could not reasonably foresee which makes it impossible for the Consulting Engineer to carry out in whole or in part his obligations under this Agreement. Upon the occurrence of such a situation or event the Services shall be deemed to be postponed for a period of time equal to that caused by the Force Majeure and a reasonable period not exceeding one (1) month to remobilize for the continuation of the Services.

2.9.3 Default by the Client

The Consulting Engineer may by written notice to the Client terminate this Agreement:

- (i) if he has not received payment of that part of any invoice which is not contested within sixty (60) days of submission thereof;
- (ii) if the Services have been postponed as provided for in Clause 2.9.2 and the period of postponement has exceeded six (6) months.

2.9.4 Entitlement of Consulting Engineer upon postponement or termination

Upon postponement of the Services or termination of this Agreement under Clause 2.9.1, 2.9.2 or 2.9.3 and subject to the obligation of the Consulting Engineer to reduce expenditure to a minimum as stated in Clause 2.9.1, the Consulting Engineer shall be entitled to receive the remuneration due up to the effective date of postponement or termination and reimbursement in full for such of the costs specified in Appendix D as shall have been incurred prior to the effective date of such postponement or termination and for all costs incidental to the orderly termination of the Services, including return travel of the Consulting Engineer's personnel, their dependents and effects.

2.9.5 Inability of an Individual Consulting Engineer to Perform

Should the Consulting Engineer be an individual person and, for any reasons beyond his control and which he could not reasonably have foreseen and for which he is not responsible, be unable to perform his obligations under the Agreement or have it performed entirely, the Agreement terminates without prejudice to the accrued rights of either party against the other.

The Client shall in that case pay the Consulting Engineer or his Successors and Assigns upon surrender of the documents necessary for the continuation of the Services, in so far as they are available, such part of the remuneration as corresponds to the state of the Services under the Agreement, including any reimbursable costs and those termination costs (if any) ensuing for the Consulting Engineer or his Successors and Assigns from contracts already entered into in respect of the Agreement.

2.9.6 Default by the Consulting Engineer

The Client shall notify the Consulting Engineer, in writing, if he considers that the Consulting Engineer is not discharging his obligations under this Agreement, stating the reasons therefor. In the event that the Consulting Engineer does not respond to such notice within fifteen (15) days the Client may deem the Agreement terminated. In this event the Consulting Engineer shall be entitled to receive the remuneration due for services rendered up to the date of notification of default and reimbursement in full for such of the costs specified in Appendix D as shall have been properly incurred prior to the date of notification of default.

2.9.7 Claims for Default

Any claim for damages arising out of default and termination shall be agreed between the Client and the Consulting Engineer or, failing agreement, shall be referred to arbitration in accordance with Clause 6 of this Agreement.

2.9.8 Rights and Liabilities of Parties

Termination of this Agreement, for whatever reason, shall not prejudice or affect the accrued rights or claims and liabilities of either party to this Agreement.

3 THE RIGHTS AND DUTIES OF THE CONSULTING ENGINEER

- 3.1 The Consulting Engineer shall exercise all reasonable skill, care and diligence in the performance of the Services under the Agreement and shall carry out all his responsibilities in accordance with recognized professional standards.
The Consulting Engineer shall in all professional matters act as a faithful adviser to the Client and, in so far as any of his duties are discretionary, act fairly as between the Client and third parties.
The Consulting Engineer, his employees and sub-contractors, whilst in the country in which the Services are being carried out, shall respect the laws and customs of that country.
- 3.2 The remuneration of the Consulting Engineer charged to the Client according to Appendix D shall constitute his only remuneration in connection with the Agreement and neither he nor his personnel shall accept any trade commission, discount, allowance or indirect payment or other consideration in connection with or in relation to the Agreement or to the discharge of his obligations thereunder.
- 3.3 The Consulting Engineer shall not have the benefit, whether directly or indirectly, of any royalty on or of any gratuity or commission in respect of any patented or protected article or process used on or for the purposes of the Agreement unless it is mutually agreed in writing that he may.
- 3.4 The Consulting Engineer will provide all the expert technical advice and skills which are normally required for the class of services for which he is engaged. Where specialist technical advice or assistance is required, beyond that committed under the Scope of Services in Appendix A, the Consulting Engineer may with the prior written agreement of the Client arrange for the provision of such services. The Client shall pay for all such services.
However, the Consulting Engineer shall retain full and unseverable responsibility for all the Services which he is committed to render under this Agreement.
- 3.5 The copyright of all documents prepared by the Consulting Engineer in connection with the Agreement rests with the Client. The Consulting Engineer may take copies of such documents but shall not use the contents thereof for any purpose unrelated to the Services without the prior written approval of the Client.
- 3.6 Equipment and materials furnished to the Consulting Engineer by the Client or purchased by the Consulting Engineer with funds wholly supplied or reimbursed by the Client shall be the property of the Client and shall be so marked.
Upon completion or termination of the Services the Consulting Engineer shall furnish to the Client inventories of the equipment and materials referred to above as it then remains and dispose of same as directed by the Client.

4 LIABILITY OF THE CONSULTING ENGINEER

- 4.1 Notwithstanding anything herein contained to the contrary, the Client shall indemnify and hold harmless the Consulting Engineer for and against any and all claims, damages, expenses or costs (including those asserted by third parties) directly or indirectly related to the Services to the extent that such claims, damages, expenses and costs exceed in total the Consulting Engineer's liability as stated in Part II of this Agreement.
This indemnification and hold harmless by the Client shall not apply in cases where such claims, damages and expenses arise from gross negligence or criminal action from the Consulting Engineer.
- 4.2 The liability of the Consulting Engineer expires as specified in Part II of this Agreement.
- 4.3 The Consulting Engineer shall be liable for any violation of legal provisions or rights of third parties in respect of patents and/or copyrights introduced into documents prepared by him.
- 4.4 Unless notice to the contrary is given in writing by the Client, the Consulting Engineer shall, at the Client's expense, take out and maintain, on terms and conditions approved by the Client, insurance against third party liability and against loss of or damage to equipment purchased, with funds provided by the Client, for the sole use of the Consulting Engineer in the execution of the Services, provided that the Consulting Engineer shall use his best efforts to maintain at his own cost, reasonable professional liability coverage.
- 4.5 The Consulting Engineer has no liability whatsoever for any damage resulting from any act of the Client which is not covered by the Scope of Services or the Consulting Engineer's instructions or written advice.

5 OBLIGATIONS OF THE CLIENT

- 5.1 The Client shall furnish without charge and within a reasonable time all pertinent data and information available to him and shall give such assistance as shall reasonably be required by the Consulting Engineer for the carrying out of his duties under this Agreement. The Client shall give his decision on all sketches, drawings, reports, recommendations and other matters properly referred to him for decision by the Consulting Engineer in such reasonable time as not to delay or disrupt the performance by the Consulting Engineer of his Services under this Agreement.
- 5.2 The Client shall facilitate the timely granting to the Consulting Engineer, and any of his personnel and, where applicable, their dependents, in respect of the country where the Services are to be carried out, of:
- (i) necessary visas, licences, permits and customs clearance for entry and exit;
 - (ii) unobstructed access to all sites and locations involved in carrying out the Services;
 - (iii) the privilege of bringing into the country reasonable amounts of foreign currency for the purposes of the Services or for the personal use of such personnel and of withdrawing any such amounts as may be earned therein by such personnel in the execution of the Services;
 - (iv) a firm authorization from the country's Central Bank or other appropriate authority that the foreign exchange component of the remuneration under this Agreement shall be allowed to be transferred to the Consulting Engineer's home country;
 - (v) repatriation in the event of emergencies.
- 5.3 The Client will facilitate the clearance through customs of any equipment, materials and supplies required for the Services and of the personal effects of the Consulting Engineer's personnel.
- 5.4 Except when exemption has been arranged, the Client shall compensate the Consulting Engineer for the unrecovered cost of any taxes, duties, levies and other impositions under the laws and regulations in the country where the Services are carried out in respect of:
- (i) any payments made to the Consulting Engineer or the personnel he brings from other countries for the purpose of carrying out the Services;
 - (ii) any equipment, materials and supplies brought into the country for the purpose of carrying out the Services and which, after having been brought into the country, will be subsequently withdrawn therefrom;
 - (iii) any property brought into the country by the Consulting Engineer or his personnel for their personal use or consumption which, after having been brought into the country, will, if not consumed, be subsequently withdrawn therefrom upon the departure of the Consulting Engineer and his personnel;
 - (iv) any stamp and other duties payable on documents.

- 5.5 The Client shall make available, free of charge, to the Consulting Engineer and his personnel, for the purpose of the Services, the equipment and facilities described in Appendix C.
- 5.6 In the event that the Consulting Engineer is delayed in obtaining the equipment and/or facilities set forth in Appendix C, he shall notify the Client of such delay and shall be entitled to appropriate time extension and proportional remuneration for completion of the Services.
- 5.7 If the anticipated equipment and/or facilities are not forthcoming the Client and the Consulting Engineer shall agree on how the affected part of the Services shall be carried out and upon a revised remuneration therefor.
- 5.8 The Client will in conjunction with the Consulting Engineer arrange for the selection and provision of counterpart personnel where required, as indicated in Appendix C hereto. Counterpart personnel will be trained by and work under the exclusive direction of the Consulting Engineer. In the event that any member of the counterpart personnel fails to perform adequately the work assigned to him by the Consulting Engineer, provided such work assignment is consistent with the position occupied by the staff member, the Consulting Engineer may request that he be replaced and such request shall not be unreasonably refused.
If counterpart personnel are not provided in accordance with Appendix C, the Client and the Consulting Engineer shall agree on how the affected part of the Services will be carried out and upon a revised compensation therefor.
- 5.9 The Client undertakes to arrange the provision of services from others in accordance with Appendix C hereto. The Consulting Engineer shall co-operate with the firms and/or individuals listed in the Appendix.
In the event that the Consulting Engineer is delayed in obtaining the services from others set forth in Appendix C he shall notify the Client of such delay and shall be entitled to appropriate time extension and proportional remuneration for completion of the Services.
If the anticipated services are not forthcoming, the Client and the Consulting Engineer shall agree on how the affected part of the Services will be carried out and upon a revised remuneration therefor.
The Client shall hold the Consulting Engineer harmless against any losses or claims resulting from the failure of others to provide the services to be arranged by the Client in accordance with Appendix C.

6 SETTLEMENT OF DISPUTES

- 6.1 Any dispute or difference arising out of the Agreement, including those considered as such by only one of the Parties, shall be finally settled under the Arbitration Rules and Procedures stipulated in Part II of this Agreement.
The Arbitrator's decision shall be final and binding on both parties. The resulting award shall be in lieu of any other remedy.
The Arbitrator(s) will not be of the nationality of either the Client or the Consulting Engineer.

7 PERSONNEL

- 7.1 The Services shall be carried out by personnel specified in Appendix B hereof for the respective periods of time indicated therein, provided that the Consulting Engineer may make such reasonable adjustments in such periods as may be appropriate to ensure the efficient performance of the Services.
- 7.2 The Consulting Engineer shall designate a Project Leader to be in charge of the project and to be responsible for liaison between the Client and the Consulting Engineer.
- 7.3 Should it become necessary to replace any person specified by name in Appendix B hereof, the Consulting Engineer shall forthwith arrange for such replacement with a person of comparable experience.
The party requesting the replacement shall be responsible for the financial consequences thereof, except in the cases when the Consulting Engineer's personnel are replaced for reasons of proved misconduct, inability to perform or violation of laws.
All such requests, for whatever reason, must be presented in writing with the particular reasons stated.
- 7.4 The Client's individual experts, if any, assigned to participate in the Services and specified in Appendix C hereof, shall only be appointed with the agreement of the Consulting Engineer and shall be remunerated by the Client. These experts may not be removed or replaced except by the Client acting in consultation with the Consulting Engineer. In all other respects such persons shall be subject to the administrative direction and supervision of the Consulting Engineer.
Notwithstanding the appointment of such persons by the Client, the Consulting Engineer shall at all times retain full and unseverable responsibility for the due performance of his obligations hereunder and for the satisfactory completion of the Services. The Client shall be liable for these experts' errors and/or omissions unless otherwise stated in Part II of this Agreement.

8 REMUNERATION OF THE CONSULTING ENGINEER

- 8.1 The Client shall remunerate the Consulting Engineer in respect of the Services in accordance with the conditions set forth in Appendix D.
- 8.2 In the event of any services being required supplementary to those detailed in Appendix A due to circumstances arising beyond the control of the Consulting Engineer and which could not reasonably have been foreseen or for any additional services, alterations or modifications as agreed between the Parties and resulting from the Client's specific requests which cause amendments to the Services or termination of this Agreement, the Consulting Engineer shall receive additional remuneration which shall be computed on a time basis together with all reimbursable costs incurred.
- 8.3 In the case of delay on the part of the Client the Consulting Engineer, to the extent that such delay results in extra cost, shall be entitled to additional remuneration. Such additional remuneration shall be computed on a time basis together with all reimbursable costs incurred.
- 8.4 If the remuneration is stipulated as a lump sum plus reimbursable costs an agreed index for escalation of the sum shall be specified in Appendix D.

9 PAYMENTS TO THE CONSULTING ENGINEER

- 9.1 The Client shall effect payments to the Consulting Engineer in accordance with the payment schedules and in the manner set forth in Appendix D.
- 9.2 Amounts due to the Consulting Engineer shall be paid promptly. If the Client fails to pay the Consulting Engineer within forty-five (45) days the Client shall pay interest as from the date of receipt of the invoice at the rate specified in Appendix D.
- 9.3 If any item or part of an item of an invoice rendered by the Consulting Engineer is disputed or subject to question by the Client, the payment by the Client of that part of the invoice which is not contested shall not be withheld on those grounds and the provisions of Clause 9.2 shall apply to such remainder and also to the disputed or questioned item to the extent that it shall subsequently be agreed or determined to have been due to the Consulting Engineer and interest at the rate specified in Appendix D shall be paid on all disputed amounts finally determined payable to the Consulting Engineer.
- 9.4 All payments made by the Client on account of foreign exchange costs shall be available for repatriation by the Consulting Engineer unless specific provision to the contrary is included in Appendix D.
- 9.5 Whenever it shall be necessary to evaluate one currency in terms of another for the purpose of the payment of an amount specified in Appendix D the rate of exchange applicable shall be the selling rate published by an official source, in the country where the Services are being carried out, on the date the payment was due.
- 9.6 Except in the case of lump sum agreements the Client may nominate a reputable firm of accountants to audit all amounts claimed by the Consulting Engineer. Advance written notice of not less than three (3) working days must be given to the Consulting Engineer by the Client, or the firm of accountants, of such audit which shall be carried out during normal working hours at the place where the records are maintained.

PROVISIONS SPECIFIC TO PROJECT

1. The subject matter included under this heading has been excerpted with some modification from

INTERNATIONAL GENERAL RULES OF AGREEMENT - PART II

CONDITIONS OF GENERAL APPLICATION

2. The following notes are intended as an aide-memoire in the preparation of clauses (some of which are dealt with, but not exhaustively, in Part I) which will vary as necessary to take account of the circumstances and the locality where the works are carried out. These variable clauses which must be specially prepared to suit each particular agreement should cover such of the undermentioned matters and any others as are applicable.

a) Language/s and law

Language/s in which the Agreement is drawn: _____

Ruling language: _____

The law to which the Agreement is to be subject: _____

b) Notices

Client's address and responsible official: _____

Client's alternative address for cables and telex: _____

Consultant's address: _____

Consultant's alternative address for cables and telex: _____

c) Authorized signatories

Signatures required for this Agreement to be effective:

Client

Consultant

d) Commencement date

The services shall be commenced within _____
days/weeks after the Agreement has come into force.

e) Completion date

The services shall be completed within _____
weeks/months of commencement of the services.

f) Financial liability of the consulting engineer

The total liability of the consultant under this Agreement shall be
limited to _____

g) Clause 4.2

Expiry of the liability of the consultant

The liability of the consultant expires _____

h) Settlement of disputes

The arbitration rules and procedures under which any dispute or
difference arising out of this Agreement shall be settled shall be _____

3. Each project has unique technical characteristics and each contract has unique legal and administrative characteristics which must be expressed in the provisions of the agreement. Some of these characteristics have previously been discussed in Section 2.7, Terms of reference and Section 2.8, Scope of work; and in Section 4.2 of this manual.

4. Because these characteristics are unique, they cannot be expressed in the relatively short and simple terminology which was used for the standard conditions.

5. It is suggested, in keeping with the wording of the standard provisions, that separate appendices be provided in the contract as follows:

Appendix A - Scope of work

The scope of work should be described as completely as possible as previously discussed in Section 2.8. The wording should reflect all the understandings reached during the negotiations.

Appendix B - Consultants personnel

In his proposal, the consultant will have described his proposed staffing for the project and presented the names and experience records of the individuals nominated to fill the key positions. Depending on the time lapse between the proposal and award of contract, these individuals may or

may not be available for the project. Appendix B should require that the project be staffed with personnel of equivalent experience to those nominated in the proposal and agreed during the negotiations.

Appendix C - Counterpart personnel, assigned specialists, equipment and facilities to be provided by the client

The number of counterpart personnel and assigned specialists, the duration of their assignments, their levels of experience, and their responsibilities should be detailed in Appendix C - the chain of authority governing these individuals should be stated explicitly.

The type, size and condition of the equipment and facilities should be described and the responsibility for maintenance, repair and/or replacement assigned.

Appendix D - Remuneration and payment

This subject has been discussed in Section 2.6. Appendix D should state the timing of payments, currency to be used, and all procedural requirements for invoicing and processing of payments.

- END -

ISBN 92-9194-321-5

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Order No. 9184P3
Printed in ICAO

