APEGGA

The Association of
Professional Engineers, Geologists
and Geophysicists of Alberta

Development of Consulting Rate Structures and Contracts

v1.0

February 2005

FOREWORD

This document is an update and replacement of the following APEGGA documents:

- *Engagement and Payment of Consultants and Subconsultants - A Guideline*. September 1987
- *Consultant Fees for General Engineering Assignments*. September 1990.
- *Consultant Fees for Geotechnical and Materials Engineering Assignments*. June 1990.
- *Consultant Fees for Geological and Geophysical Assignments*. June 1990.

Participants

APEGGA's Practice Standards Committee (PSC) publishes practice standards and guidelines to achieve uniformly high standards of professional practice which meet the intent of the *Engineering, Geological and Geophysical Professions Act* and which identify what the public should expect from any Professional Member of APEGGA. The goal of the committee is also to achieve an atmosphere in which a competent and effective consulting industry can thrive and produce direct benefits to the public. During the time the document was revised, the committee had the following membership:

Dick Walters, P.Eng., *Chair*
Rory Belanger, P.Eng.
Mark Bowman, P.Geoph.
Barry Colledge, P.Eng.
Harry Dowhan, P.Eng.
Ron Kozak, P.Eng.
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1 OVERVIEW

Written Contracts and clearly defined rates help minimize misunderstandings. Through the use of examples, this document illustrates numerous factors that may be considered in choosing a method of compensation and in establishing a formal Contract. Note that APEGGA and the Alberta Association of Architects (AAA) have developed specific guidelines addressing fees and Contracts for building Projects.[1]

Selecting a Consultant is one of the more important decisions that a Client must make. For the Client to obtain the best value from consulting services, fees should be derived from an agreed scope of work. APEGGA encourages using Qualification Based Selection (QBS) criteria, a procedure where a Consultant is chosen on the basis of the best possible qualifications and fees are negotiated after a mutual agreement in scope of work has been reached. Readers wishing such information should refer to the APEGGA guideline *Selecting Engineering, Geological, and Geophysical Firms,* the Association of Consulting Engineering of Canada (ACEC) document *Qualification Based Selection*, and the Consulting Engineers of Alberta (CEA) document *Qualifications Based Selection System*.[2]

1.1 Scope

This document presents several alternative methods for establishing consulting fees for professional services without recommending minimums or maximums. It also provides general guidance respecting formal Contracts, ownership of Drawings and copyright, and management of risk. This document is not to be construed as legal advice and parties should seek legal counsel in that regard, as they see fit.

1.2 Purpose

One of the primary purposes of this document is to provide Consultants with information to assist them in how to establish a suitable method of compensation for their professional services. The document's purpose is not to determine what a Consultant's fees should be. Although APEGGA supports the notion of fair compensation commensurate with the level of professional services provided, the Consultant and Client are free to reach their own agreements on what 'fair' means.

The other main objective is to provide general information that will help Consultants and Clients prepare written Contracts that clearly define the parties' expectations regarding professional services.

1.3 Definitions

For the purposes of this document, the following terms and definitions apply.

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1 *Ensuring the Success of Your Building Project*, APEGGA and AAA, 2003. *Recommended Conditions of Engagement and Schedule of Professional Fees for Building Projects* and *Schedule of Designated Services for Recommended Conditions of Engagement and Schedule of Professional Fees for Building Projects*, APEGGA and AAA, 1998.

2 These documents are available online at www.apegga.org, www.acec.org, and www.cea.ca.

Client
The Owner or agent of the Owner who requires the services of a consulting Professional Member.

Code of Ethics
Scheduled Code of Ethics established pursuant to section 19(1)(j) of the *Engineering, Geological and Geophysical Professions Act*, R.S.A. 2003, c. E-11.1.

Consultant
An individual or entity registered with APEGGA to engage in the practice of engineering, geology or geophysics in the Province of Alberta who provides professional services directly to a Client.

Contingency Allowance
An amount added to cover any additional costs that may occur due to unforeseen events or changes in the scope.

Contract
A private agreement entered into voluntarily by at least two Persons, recognized by law, which gives rise to obligations that the courts may enforce.

Contractor
The Person who Contracts to carry out the intent of the Drawings or documents for a Project.

Disbursements
Reimbursable expenses incurred by the Consultant on the Project (refer to Appendix C), not part of the Consultant's regular overhead costs.

Drawings
The graphic and pictorial representation of the Project.

Frustration of Contract
The doctrine that, if the entire performance of a contract becomes fundamentally changed without any fault by either party, the Contract is considered terminated.

Owner
The Person who owns the property under consideration by the Contract and has authority of ownership.

Person
An individual, corporation, company, association, firm, partnership, society, or other entity/organization.

Prime Consultant
The Professional Member acting on behalf of the Client, under whose overall direction and control Drawings, Specifications, or other documents are prepared and stamped.

Professional Member
A professional engineer, professional geologist, professional geophysicist, registered professional technologist (engineering), registered professional technologist (geological), registered professional technologist (geophysical), or licensee entitled to engage in the practice of engineering, geology, and geophysics under the *Engineering, Geological and Geophysical Professions Act*, R.S.A. 2003, c. E-11.1.

Project
The total work contemplated.

Specifications
The detailed definition or requirements of the engineering or geoscience Project to be completed. This may include detailed Project Drawings showing required dimensions, units of measurement, quality of materials, and product designations or parts and equipment. This should also include product standards, referencing recognized testing authorities where possible (i.e., Canadian Standards Association (CSA) or American Society for Testing Materials (ASTM)).

Specialist Consultant
The Professional Member, engaged on behalf of the Client or Prime Consultant to provide technical expertise relating to a specific component of a Project rather than to the overall Project.

Stamp
The stamp or seal issued to a Professional Member by the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA).

Subconsultant
The Professional Member, acting on behalf of the Prime Consultant, under whose overall direction and control Drawings, Specifications, or other documents for a specific component of a Project are prepared and Stamped, rather than for the overall Project.

Subcontractor
The Person who has a direct Contract with the Contractor to perform a part or parts of the work or to simply provide for a Project.

Tort
A civil wrong, for which a remedy may be obtained, usually in the form of damages.

Trust
A property interest held by one Person (the trustee) at the request of another (the settler) for the benefit of a third party (the beneficiary).

1.4 Organization of Document

This document is organized into two main parts. The first part, presented in Section 2, introduces methodologies for determining rates. The second part, presented in Section 3, reviews the components of a Contract. Sections 4 through 6 and the appendices

discuss issues related to both fees and Contracts: additional considerations, ownership of Drawings and copyright, managing risk, categories of service, sample fee calculations, Disbursements, fee as percentage of estimated Project cost, and sample Contract forms and references.

2 METHODS OF DETERMINING CONSULTING FEES

The following are methods for determining fees for engineering and geoscience services:[3]

1. Hourly Basis
2. Fixed Fee or Lump Sum Basis
3. Fee as Percentage of Project Cost
4. Cost Reimbursable Plus Overhead
5. Combination of Hourly and Fixed Fee Basis

Each fee basis may be more appropriate for certain applications. Frequently, combinations of the methods are applied to different stages of a Project and different categories of service (refer to Appendix A). However, note that any fee method may be used on all types of Projects.

Also note that the different fee bases vary the financial risk that is borne by the Consultant and Client, given Project uncertainty. Clients and Owners must recognize that transferring risk to the Consultant increases the cost of services. Regardless of which fee basis is used, the underlying principles are due consideration of value of the services provided and the level of risk undertaken.

2.1 Hourly Basis

Engineering and geoscience consulting fees may be expressed as a function of hourly rates. This fee basis is particularly applicable in circumstances where the scope of assignment is not well defined or where the Consultant may not have control over person-hours and disbursements required on specific stages of a Project. Geology and geophysical evaluations are usually billed on an hourly basis.

All categories of service can be supplemented with a target fee where the scope of the assignment is well defined. As changes in the scope of work are identified, appropriate adjustments in the target fee are warranted. The Contract should cover scope, schedule, time limits, inflation and other identifiable items that influence costs as well as changes in the scope of work.

Traditionally, there have been two methods of establishing hourly rates – the 'flat rate' method and the 'multiplier' method. The flat rate is normally used and the multiplier method is now seldom used. Appendix B provides a sample calculation to assist Consultants in setting their hourly rates.

3 *The Engineering and Construction Contract – An NEC Document, Guidance Notes*. The Institution of Civil Engineers. Thomas Telford, London, 1995.

2.2 Fixed Fee or Lump Sum Basis

The fixed fee or lump sum may be on the basis of either an activity schedule or a bill of quantities.[4] This fee basis applies only to Projects or components of Projects where the scope of the work is clearly defined and can be completed over a known schedule. Fixed fee or unit cost is also applicable to routine work (e.g., cost for seismic testing/line km, cost/sample analyzed, cost of inspection/unit, or design cost/m^2).

Given the preparation of the scope of work, the fixed fee or lump sum for an assignment may then be negotiated. The key assumptions made in developing the estimate must be identified, agreed to in the negotiation process, and defined in the Contract. The final Contract should cover services to be provided, categories of cost, schedule, personnel classification, overtime, time limits, inflation and other identifiable items that influence costs. The method for making changes in the scope of work, after the fixed fee has been established, should be covered in the Contract.

2.3 Fee as Percentage of Project Cost

On some Projects, the scope of services is relatively predictable and fees can be derived as a percentage of the Project cost. This fee basis is typically used when the dollar amount is high and the Client and Consultant share in the risks and rewards of the outcome. The Client easily understands the price to be charged and the Consultant's liability exposure is determined by the dollar amount involved. The billing price is not dependent upon the hours spent, so efficiencies accrue to the Consultant.

A graph illustrating this relationship is shown in Appendix D. The range of percentage fees shown on the graph corresponds to varying levels of Project complexity as described. The graph may be used as a guide to determine if the fixed fee, resulting from the consulting cost estimate, is reasonable.

2.4 Cost Reimbursable Plus Overhead

The cost reimbursable basis is often used for Engineering-Procurement-Construction (EPC) Contracts or for Projects which are very large (i.e., > 100,000 person-hours/year), with an incomplete definition of the scope of work to be completed, yet requiring an early start. The Consultant takes minimal risks on costs and is paid actual costs plus a fee to cover overhead. Sample formulas are:

Total Fee = Σ (Actual Costs + Disbursements) X Factor

or

Total Fee = (Actual Costs X Factor) + Disbursements

where:

- Actual Costs = payroll costs + direct costs
- Disbursements = reimbursable expenses incurred on the Project (refer to Appendix C for examples)

4 *The Engineering and Construction Contract – An NEC Document, Guidance Notes*. The Institution of Civil Engineers. Thomas Telford, London, 1995.

- Factor = to cover overheads and profit

2.5 Combination Hourly and Fixed Fee Basis

Projects frequently require several categories of Consultant services. Some services can be accurately quantified at the commencement of the Project while others vary with schedule and unpredictable conditions. In these circumstances, the services that can be accurately described and quantified may be appropriately covered by a fixed fee basis. Those that are unpredictable may be covered on an hourly basis.

A judicious combination of the hourly basis and fixed fee basis for different phases of a Project permits a variety of innovative fee concepts that encourage execution efficiency without sacrificing quality of service. These concepts include targets, bonuses, cost plus fixed fee and other variations.

2.6 Availability Only Retainer

This fee ensures that the Consultant is on call and available when requested. This is appropriate for expert witness services, Specialist Consultants, advisory services, or other technical representation. The retainer should take into consideration the potential loss from being restricted in the marketplace.

2.7 Retainer as Deposit against Future Services

The retainer as deposit against future services is a method of assuring payment if the Client's integrity is unknown or ability to pay is questionable. This method may be combined with any other fee basis.

2.8 Alternative Fee Methods

Other pricing methods may be used to respond to market demands. Following is a summary of alternative fee methods, applicable to engineering and geoscience consulting services.[5]

Blended Hourly Rate Basis

This fee basis is particularly applicable in circumstances where the scope of assignment is not well defined, but the Consultant knows the mix of personnel to complete the Project. Thus, the Client is given an hourly rate that is the weighted average of all the personnel involved. Say the principal is involved 20% of time at $X/hr, a staff engineer is involved 35% of time at $Y/hr, and a technologist is involved 45% of the time at $Z/hr. A sample formula for the blended hourly rate would be:

$$(\$X)(0.2) + (\$Y)(0.35) + (\$Z)(0.45) = \$/hr$$

The blended hourly rate may also be used when a sole practitioner or a principal of a practice performs services that would typically be provided by a staff member at a lower charge rate. This rate gives the Client an idea of the costs associated with the Project,

5 Baker, Ronald J., *Professional's Guide to Value Pricing – Third Edition*, Aspen Law and Business, 2001.

given uncertain scope. Yet, it also offers the Consultant the opportunity to use personnel more efficiently.

Value-Added / Profit Sharing
The premise of value-added pricing / profit sharing is that through the Consultant's expertise, additional value and/or profit may be identified and gleaned for the Client. This provides incentive to the Consultant to be more creative in providing services beyond the scope of work, seeking higher productivity, or where the Consultant's proprietary knowledge is offered to the Client.

However, many Clients expect that the Consultant will design the best solution as a matter of course and not as an extra, value-added proposition. To segregate value-added from basic engineering/geoscience services, Consultants can offer such services on a separate fee basis, often as part of an overall incentive or performance based contract.[6]

If value-added pricing is too uncertain, the actual value of the services to the Client may be determined retrospectively, at the completion of the Project. This acts as an incentive for the Consultant to capture additional benefits, while allowing time for the Client to accrue and properly value the benefits.

Exchange of Services
Professional services may be exchanged for another good or service such as office space, technical support, or other professional services.

Payment in Shares or Options
This fee basis is generally applied in exploration geology or geophysics. Upon the discovery of an oil/gas or mineral play, the Consultant negotiates a stake in the developed Project or property.

3 THE CONTRACTUAL AGREEMENT

Sound Contracts between the Client and the Consultant reduce misunderstandings. There is no strict requirement as to the "form" of a Contract. Some verbal Contracts are enforceable. However to reduce risk and uncertainty, most Contracts should be reduced to a single written form and signed by all of the parties to it.[7] The duration and complexity of the Project often govern the complexity of the Contract.[8]

For a Contract to be legally binding and enforceable, five main elements must be present: 1) offer and acceptance without qualification, 2) lawful purpose, 3) mutual intent to enter into the Contract, 4) capacity to Contract (e.g., no minors), and 5) a promise by each party to give something of value to the other party.

6 Jergeas, George, "Value Engineering Incentive Clauses", *Cost Engineering*, 1999.
7 For a complete discussion of developing Contracts specific to building Projects, refer *Recommended Conditions of Engagement and Schedule of Professional Fees for Building Projects*. The Alberta Association of Architects and APEGGA, 1998.
8 *The Engineering and Construction Contract – An NEC Document, Guidance Notes*. The Institution of Civil Engineers. Thomas Telford, London, 1995.

The purpose of this document is not to provide a comprehensive discussion of Canadian civil and contract law – others already do that very well.[9,10] Suffice it to say that the Contract between the Client and Consultant has contractual and civil obligations for both parties. For example, contractual obligations include: the Client's obligation to pay for the work done, the Consultant's obligation to perform the work, and any other obligations contained in the Contract either expressed or implied. Civil obligations for both parties include: a duty to apply due diligence and a reasonable standard of care, a duty to warn, and no negligent or fraudulent misrepresentation. Note that either the Client or the Consultant may be found liable and suits of civil Tort and contractual breach may be concurrent.

The *Alberta Limitations Act 1999* sets time limits for breach of Contract lawsuits. The 'discovery rule' states that claims must be brought forward within two years from the date the claimant knew or ought to have known that the breach occurred. The 'drop dead rule' states that the claims must be brought forward within ten years when the claim arose.

3.1 Project Organization

The form of the Contract depends upon the Project organization. This document assumes a traditional Client - Prime Consultant / Subconsultant relationship (refer to Figure 1). The Client retains the Prime Consultant for the total Project and the Prime Consultant in turn retains a Subconsultant for specific portions. Additionally, the Client may engage a Specialist Consultant to provide technical expertise relating to a specific component of a Project rather than to the overall Project.

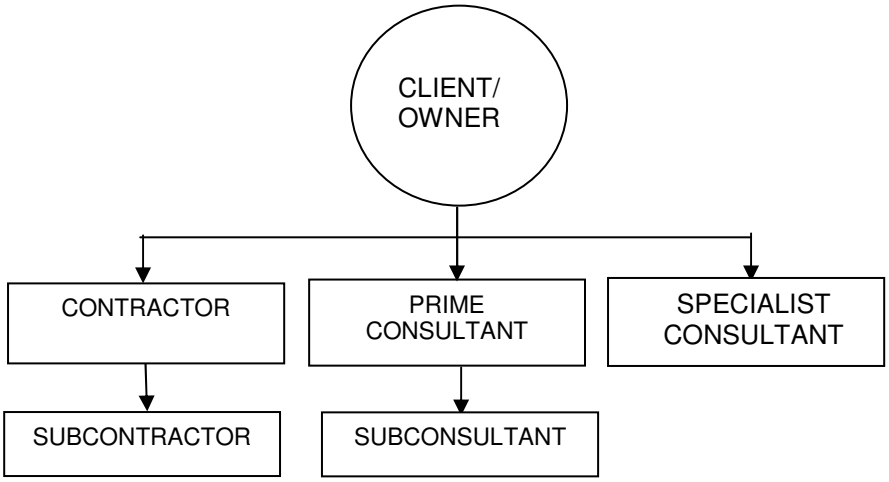


Figure 1 – Traditional Client-Consultant-Contractor Organizational Structure

9 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996.

10 Excerpt taken from Dr. George Jergeas' presentation *Risk and Loss Management: Roles and Responsibilities of Professionals*, given at APEGGA's Professional Development Days in Edmonton and Calgary, November 2004.

Other organizational arrangements can be made (i.e., Project Management, Design-Build, Engineering-Procurement-Construction (EPC), Turnkey, Build-Own-Operate-Transfer (BOOT)) but any changes should take into account shifts in responsibility between the parties. In some cases, the Client may take part in the selection and/or the payment of Subconsultants. In such situations, it is important that the Prime Consultant be a party to and approve of such selection and payment in order to maintain control of the Project.

3.2 Client's Contractual Obligations

The role to be played by the Client with respect to the planning, financing, provision of a reasonable Contingency Allowance, and management or coordination of the Project should be clearly defined before establishing the scope of the assignment and entering into a Contract with the Consultant. The Client's contractual obligations, expressed or implied, include the following:[11]

- Provide agreed upon payment for the scope of work
- Make the site available
- Provide owner-supplied materials and facilities
- Facilitate the coordination of the other Consultants
- Timely approvals
- Not to interfere with the method of execution
- Issue change orders
- Duty to disclose superior knowledge and all relevant data
- Discretion exercised reasonably

3.3 Developing the Consulting Contract

The written Contract between the Client and Consultant should address, as a minimum, the following items:

1. Scope of Assignment
2. Time – terms of timing and schedule of execution.
3. Terms of Payment
4. Basis of Fee
5. Performance and Compensation Events
6. Scope and Fee Changes
7. Resolution of Disputes
8. Termination of Contract
9. Other terms and conditions mutually acceptable to both Client/Owner and Consultant

Note that the submission of any one of the Consultant's proposals to the Client may constitute a Contract or the basis of formation of a Contract between the two parties.[12] Many organizations, such as government, have standard Contract formats in their

11 Excerpt taken from Dr. George Jergeas' presentation *Risk and Loss Management: Roles and Responsibilities of Professionals*, given at APEGGA's Professional Development Days in Edmonton and Calgary, November 2004.

12 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996, p. 179.

Request for Proposal (RFP) which present the final Contract. The Consultant often has limited control over the final Contract format.

In many cases, the Consultant's decision is whether to provide a proposal or not. However, the Consultant may submit a qualified proposal which varies the conditions of the RFP. Such qualifications change the basis of the RFP and are effectively a new offer to the Client. Once the proposal is submitted, the final Contract may be created without additional input from the Consultant.

The specific components of the professional services Contract are discussed next.

3.3.1 Scope of Assignment

A detailed discussion of the Consultant's categories of service, that may be included in the Contract scope, is provided in Appendix A.

Following are guidelines in establishing the scope of assignment for the Prime Consultant, Specialist Consultants, and Subconsultants:

1. The scope of assignment and deliverables that are agreed to must meet the requirements of the governing codes and regulations.
2. The Prime Consultant is responsible for the adequacy of the scope of assignment for the whole Project team based on the defined needs of the Client. This responsibility includes formally and fully advising the Client of the consequences of scope restrictions.
3. Subconsultants must make the Prime Consultant aware, at the commencement of a Project, of any special scope requirements which will affect the quality of their professional service.
4. Prime Consultants must not dictate and Subconsultants must not accept scope restrictions, which may prejudice protection of the public and/or the needs of the Client.
5. In many Projects, areas of overlap in scope will exist between disciplines. It is the responsibility of each Consultant to notify the Prime Consultants and other Consultants when elements of his or her discipline may affect their work. The Prime Consultant, in coordinating the other Consultants should identify overlaps and gaps and deal appropriately with them.
6. The extent of each Consultant's scope of work should be based on the qualifications and expertise of the Consultant and the needs of the Project.
7. The Prime Consultant should establish the degree to which he or she and the other Consultants will delegate design assignments to the Contractor. Where such assignments are delegated to the Contractor, the other Consultants should specify that qualified professionals be responsible for the design of all delegated components.[13]
8. The Client, the public, and the approving authorities have a right to expect that each Consultant, whether in the role of Prime or Sub, will be responsible for the design and review of the Project falling within that Consultant's discipline, unless appropriate

13 *Recommended Conditions of Engagement and Schedule of Professional Fees for Building Projects*. The Alberta Association of Architects and APEGGA, 1998.

scope restrictions are clearly identified in any documents bearing the Consultant's Stamp.

3.3.2 Time

Time may be specified in the Contract through any of the following:

- Specific Project start date and substantial completion date (e.g., maintenance Contracts).
- Specific scheduling conditions such as expiry dates/clauses, acceleration clauses, extension clauses, termination clauses, etc.
- Unspecified Project scheduling – Project schedule that extends as long as is required to complete the particular work.

3.3.3 Terms of Payment

Following are guidelines regarding the terms of payment:

1. The terms of payment included in the Prime Consultant's Contract with the Client should include details of the payment arrangement, any variations in payment due dates, and interest on overdue accounts. It is the Client's obligation to pay promptly with interest accruing on late payments. If there is any dispute, the payment should be placed in Trust. Negotiation is encouraged as the first mechanism to resolve any disputes.
2. These terms of payment between the Client and Prime Consultant also form the basis for the payment terms in the Contracts between the Prime Consultant and the Subconsultants. Funds received by the Prime Consultant for services provided by a Subconsultant are received on behalf of the Subconsultant. These funds should be distributed in accordance with the Terms of the Contract between the Prime Consultant and Subconsultant.
3. If the Client withholds a portion of the Prime Consultant's fees due to deficiencies in services performed by a Subconsultant, the Prime Consultant may be entitled to withhold a commensurate proportion of the fees to Subconsultant in question, in compliance with legal requirements, and held in Trust.
4. In circumstances where the Prime Consultant has assigned all receivables, or where the funds might otherwise be intercepted, the Subconsultants who may be affected should be advised at the time of their engagement, or subsequently if circumstances change during an assignment.

3.3.4 Basis of Fee

The cost of Consultant services is typically negotiated after Consultant selection and agreement with the scope of work. While the level of fees may be negotiated to appropriately reflect the Client's needs, it should be recognized that inappropriate remuneration may impair the Consultant's ability to complete the work. A discussion of fee basis is given in Section 2. More complex Contracts may require consideration for multiple currencies or price adjustments for inflation.

An estimate of the cost of the consulting Project is sometimes included in the Contract. However, discrepancies between the estimate and actual costs have been taken to court. To protect against this, a suitable disclaimer clause ensures that the Consultant is not held responsible for cost overruns outside of his or her control.

Note that if a Consultant is retained by a Client without agreeing to the fee, "the law implies that the engineer [or geoscientist] shall be paid a reasonable amount for services on a *quantum meruit* (as much as deserved) basis".[14]

The following are general guidelines for establishing the basis of fee between the Client and Prime Consultants / Specialist Consultants / Subconsultants.

1. Fees for Specialist Consultants and Subconsultants should be negotiated based on their qualifications, experience, and time expended. Specialist Consultant and Subconsultant's fees should be negotiated independently from the Prime Consultant's fees and should be paid directly by the Client or by the Prime Consultant as additional services.
2. The Contract negotiated by the Prime Consultant with the Client should be complementary and parallel with the Specialist Consultant and Subconsultant.
3. It is considered good practice and professional for the Prime Consultant to disclose to the Client the scope and fee arrangements with all Subconsultants to establish trust and full disclosure of any potential conflict with the Client's interests.
4. The Client/Prime Consultant/Subconsultant Contract should be in writing using a clear and simple format (refer to samples in Appendix E).
5. Changes in fees due to unanticipated changes in the scope of services should be communicated so that all parties affected are informed with respect to the changes proposed and the fee negotiated. The negotiation of changes should be based on a formal notification of requests for changes combined with evidence of cost management and budget control.

3.3.5 Performance and Compensation Events

Compensation to the Consultant for work completed, may take many forms. Some of the more common compensation methods include the following:

- Advanced payment to the Consultant requiring significant investment.
- Monthly invoicing for an ongoing Project.
- Progress payments for sectional completion of a larger Project. Note that progress payments should reflect as close as possible the amount of work done.

3.3.6 Scope and Fee Changes

The Prime Consultant is responsible for establishing an appropriate scope of assignment. However, the Contract should contemplate a change management process for handling any scope changes. Unanticipated scope changes may also justify changes to the fee structures in the Client / Prime Consultant / Subconsultant Contracts. Any changes should be negotiated through the involvement of all parties affected. If Contracts are not modified to accommodate such changes, it may adversely affect the Consultant or Subconsultants' ability to complete the work satisfactorily.

14 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996, p. 158.

3.3.7 Resolution of Disputes

The Contract may specify that disputes be resolved through various methods. Consider negotiation and mediation first to avoid court. Next consider arbitration. Litigation should be considered as a last resort. Regardless of the dispute resolution method used, Clients and Consultants shall consider their professional responsibility under the Code of Ethics.

3.3.8 Termination of Contract

The Contract may be terminated by either the Client or the Consultant by the following main methods:[15]

- Performance – fulfilling the terms of the Contract completes the obligation and terminates the Contract.
- Mutual Agreement – parties to the Contract may mutually agree to amend or terminate the Contract at any time.
- Expressed Terms – the Contract may specify expressed terms and conditions (i.e., bankruptcy by one party, failure to comply with the Contract including payment) as grounds for termination.
- Frustration – changes to circumstances which radically alter the contractual obligations.
- Breach – fundamental breach of the Contract by either party.

3.3.9 Other Terms and Conditions

The Contract may include other general and supplementary terms and conditions. These may include, but are not limited to:

- Details of the work, the people involved, and Project administration.
- Specific owner requirements.
- Limitation of liability and disclaimer clauses.

3.4 General Administrative Guidelines

It is recommended that the body of the Contract follows several administrative guidelines.

- If there are changes to a Contract prior to the document being signed, do not cross out items and hand write names or amendments. Have these documents amended on the computer and reprinted. If any changes are handwritten or typed onto the printed document ensure that all parties initial each change.
- Where reference is made to descriptions of land, a land titles search should be performed to confirm title accuracy and ownership.
- There should be no blank spaces in the Contract (i.e., quarter page left blank).
- Page numbers are consecutive (suppressed numbering on page 1) and no pages are missing.
- Paragraph numbers are consecutive.
- Final paragraph and signatures are not alone on a page.

15 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996, p. 158.

- All necessary affidavits are executed and copies of each affidavit are attached to each copy of the Contract.
- All schedules referred to in the Contract are labeled correctly, starting with Schedule "A" and one copy of each schedule is attached to each copy of the Contract.
- No material other than schedules and applicable affidavits are attached to the Contract (i.e., Affidavit of Execution, Affidavit of Corporate Signing Authority).

4 ADDITIONAL CONSIDERATIONS

Additional consideration should be given to services that may be outside an existing Contract, such as the following.

4.1 Scope Changes

Services required beyond the agreed scope of assignment, beyond those normally provided (i.e., specialized equipment rentals), or beyond the original basis of fee to be negotiated on basis mutually acceptable to both Client and Consultant.

4.2 Services Performed by Someone other than the Original Consultant

The Consultant responsible for the planning and design of a Project would normally be retained to provide coordination, inspection, administration services, and reporting on a Project. In circumstances where a Consultant is retained to perform these services on a Project for which the Specifications were prepared by others, or the work was initiated by others, the Consultant's unfamiliarity with the Project should be taken into account in the fee negotiation process. At a minimum, it is recommended that the fee be on an hourly basis.

4.3 Re-Use of Drawings and Specifications[16]

Re-use of the design on subsequent Projects requires permission from the Consultant who stamped the Drawings to control the application and the use of information. The design, represented by Drawings and Specifications, stamped by the Consultant is the Consultant's responsibility. The use of the design by the original Client is intended to cover one Project only, unless the Contract is for a prototypical Project which will be repeated over and again or copyright is assigned in writing to the Client. Unauthorized reuse of Drawings and Specifications will void any professional responsibility and legal liability.

Payment for modifications to a design to accommodate different conditions encountered on a second Project should be made on a mutually agreed upon basis. Fees to cover professional responsibility resulting from second and subsequent re-use of the design should be the subject of negotiation for each re-use. The fee negotiated should reflect the complexity of the design and the exposure to risk that arises from its re-use.

16 Refer to the APEGGA Guideline *Relying on Work Prepared by Others*, June 2003. This guideline is intended to help Professional Members identify work by others, evaluate the quality and applicability of that work to the assignments with which they are involved, and understand their responsibilities and obligations when using others' work.

4.4 Delays

In some circumstances, delays beyond the Consultant's control may cause an increase in the cost of the services provided by the Consultant. The additional costs, including inflation, should be paid on a basis mutually agreeable to both the Client and Consultant.

4.5 Abandonment of Project

If the Project is abandoned or suspended, through no fault of the Consultant, the value of the service supplied by the Consultant should be negotiated and should include an appropriate allowance for costs resulting from the suspension plus lost profit and preparation time for the proposal. The intent is to recover costs associated with efforts expended to date.

4.6 Alternative Design

A Client may require the Consultant to prepare alternative designs beyond the scope of the assignment originally agreed to. The fee for all extra work required to prepare the alternative designs should be on a basis mutually agreeable to both the Client and Consultant.

4.7 Travel Time

Any payment for travel time should be established. Variations in circumstances from one Project to another should be considered.

5 OWNERSHIP OF DRAWINGS AND COPYRIGHT

Ownership of Drawings, Specifications, and other documents is frequently confused with ownership of copyright. The ownership of Drawings and related documents is governed by the Contract between the Client and the Consultant and unless otherwise stated, remains with the Client. The ownership of copyright refers to intellectual property (the ideas embodied in the Drawings, details, or concepts developed and not specifically paid for by the Client) and the right to reproduce those ideas remains with the Consultant. Ownership and copyright should be covered in the Contract. The legal and professional practice considerations are discussed next.

5.1 Legal Aspects

Following is a summary of the legal aspects of ownership and copyright.[17]

1. The Consultant who creates the copyrighted work retains it unless it is expressly assigned to another in writing or is allowed to enter the public domain (i.e., by publication in magazines or journals) without reservation of copyright.
2. The Drawings, Specifications, and other documents produced by a Consultant are the property of the Client once they have been paid for unless the Client/Consultant Contract contains provisions to the contrary.

17 M^{c}Lachlin, Beverley M. and Wilfred J. Wallace, *The Canadian Law of Architecture and Engineering*, 1987.

3. Documents produced by a Consultant while acting as a certifier or as an independent administrator of a Contract between his or her Client and a Contractor or supplier are the property of the Consultant.
4. Documents, such as design notes, calculations, and communication records, which are produced by the Consultant for the sole purpose of assisting him or her in carrying out an assignment for a Client, are the property of the Consultant.
5. Technical background data, details, and concepts developed by the Consultant and provided to the Client to benefit the Client and Project are the property of the Consultant.

5.2 Considerations for Practice

Consideration should be given to the above legal aspects in the drafting of the Client/Consultant Contract for a particular Project. Following is a summary of considerations for professional practice:

1. To prevent re-use of Drawings, Specifications, and other documents prepared by a Consultant engaged by a Client, an appropriate clause should be inserted in the Client/Consultant Contract stating that the documents are the property of the Consultant and are not to be used on any other Project without prior written consent. The copyright symbol © may be inserted on the documents to reinforce intellectual ownership.
2. If a Client wishes to prevent the re-use of an idea (i.e., an innovative technical feature or specific architectural appearance) that has been developed by the Consultant while engaged by the Client, an appropriate clause should be inserted in the Client/Consultant Contract stating the specific elements of the design that are not to be used on other Projects without prior written consent.
3. Originals or reproducible copies of stamped documents prepared by a Consultant should be provided to the Client for use on that specific Project, if requested. The Consultant should also retain originals or reproducible copies for his or her own records.
4. All Clients and Consultants should be guided by the Code of Ethics regarding the re-use of others' Drawings or the ideas embodied in them.
5. If a Client or Consultant intends to use documents produced by another as reference material, they are encouraged to properly notify the author. If a Client or Consultant intends to use extracts or to copy documents produced by another, permission should be obtained before doing so and full credit should be given to the original author.

6 MANAGING RISK

Characteristics of the Project, the Client, and the Contract pose a degree of risk to the Consultant. By considering these factors, the risk may be reduced or mitigated through Project management, Contract language, and insurance provisions.

6.1 Client and Contract Considerations

Following is a partial list of considerations for the Consultant when selecting a Client.

- **Financial resources:** Does the Client have adequate financing to undertake and complete the Project and withstand potential increased Project costs? Would quality be compromised if Project costs exceed funds originally allocated in the budget?
- **Professional approach:** Does the Client view the Consultant as a trusted advisor with authority to carry out the assignment? Or will the Client create an adversarial relationship which may lead to disputes and lawsuits?
- **Experience:** Is the Client experienced with the type of Project and has a corresponding understanding of design and/or construction?
- **Attitude toward Professional Fees:** Does the Client have flexibility to increase fees for Project optimization or extras if conditions warrant?
- **Use of Qualifications Based Selection:** In the selection process, does the Client consider the qualifications required to meet the needs of the Project and to ensure the quality of the completed work?
- **Project Funding and Contingencies:** Has the Client built in financial and scheduling Contingency Allowances to cover risks and unforeseen events?
- **Approach towards Quality:** Is the Client interested in a quality Project on a life cycle cost basis or more interested in rapid Project completion and sale?
- **Client's Expectations:** Does the Client have a clear understanding of his or her needs and realistic expectations?
- **Relationship with Client:** Is there a real or apparent employer-employee relationship between the Client and the Consultant? If so, the Client may be obligated to pay payroll deductions.
- **Front End Planning:** Has the Client prepared thorough front-end documents such as a feasibility report (i.e., has the Client properly defined the Project scope, needs, and requirements)?
- **Fast Tracking:** Is the Client fast tracking the Project (i.e., is there overlapping scope definition, design, procurement, and execution)? This approach might create significant and additional risks to the Consultant.

The Consultant should consider the following when developing the Contract for professional services.

- **Terms:** Are the terms fair and equitable or are there onerous clauses such as unreasonable 'hold harmless' provisions? Do the terms limit the financial exposure of the professional practice for deficiencies in their services?
- **Performance:** Is the Client requiring a guarantee of financial results or products, over and above reasonable care and due diligence?
- **Scope of Services:** Is the scope of services well defined? Does it allow changes as the work progresses? Or is the scope of services poorly defined with emphasis on financial constraints?

- **Schedule:** Does the Client's schedule impose a stress on the Consultant with penalties for late delivery?
- **Contract Compatibility:** Is the professional services Contract compatible with other, related Contracts (e.g., the construction Contract)?
- **Insurance Requirements:** Does existing Errors and Omissions and Professional Liability insurance meet the requirements of the Consultant, the Client, and the scope of work?

The above factors should be evaluated and, where possible, negotiated to minimize the associated risk.

6.2 Limiting Liability

After considering the general terms of the Contract, specific attention should be given to limiting liability. Contracts usually specify the scope of work, but remain silent on the degree of care required. The "…degree of care will be an implied term in the Contract….an engineer [or geoscientist] is liable for incompetence, carelessness, or negligence that results in damages to the Client; the engineer [or geoscientist] is responsible as a professional for not performing with an ordinary and reasonable degree of care and skill."[18] The Consultant may limit his or her liability through the inclusion of a liability allocation clause in the Contract (e.g., specifying proportional liability instead of joint and several liability).

The Consultant may also include a specific limitation of liability clause. Such a clause may limit liability to no less than the Consultant's fee or to no more than his or her professional liability insurance[19]. Following is an example of how a limited liability clause may read for a Client/Consultant Contract:

> "Owner and [Consultant] have discussed the risk, rewards and benefits of the Project and the design professional's total fee for services. [They] acknowledge that the benefits vary disproportionately between them. Accordingly, the risks have been allocated such that the Owner agrees that, to the fullest extent permitted by law, [that the Consultant's] total liability to Owner for any and all injuries, claims, losses, expenses, damages or expenses arising out of this [Contract] from any cause or causes shall not exceed the total amount of [insert fee, negotiated dollar amount, percentage of construction cost or maximum dollar amount not to exceed 50% of policy limit or $50,000, whichever is smaller]. Such causes include but are not limited to [Consultant's] negligence, errors, omissions, strict liability, breach of Contract, or breach of warranty." [20]

XL Insurance makes additional recommendations regarding limitation of liability clauses.[21] To be able to enforce a limitation of liability clause, some courts require that it be negotiated, or at least negotiable. As such, the Consultant and Client should

18 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996, p. 157.
19 Marston, D.L., *Law for Professional Engineers – Canadian and International Perspectives, Third Edition*. McGraw-Hill Ryerson, 1996, p. 151.
20 Zoino, William S., "Cautious Risk Taking", *Civil Engineering*, October 1989, p. 66.
21 *Limitation of Liability, V-53*, XL Insurance.

discuss and agree upon an equitable liability limit. If liability is linked to the amount of professional liability insurance, the wording of this clause should also state 'insurance coverage available at the time of settlement or judgment', in the event that the Consultant's policy has been limited by a prior claim. To emphasize the limitation of liability clause, it is recommended that it be bolded, initialed separately, or placed at the very end of the contract just above the Client's signature line. It is important to note that limitation of liability clauses only apply to claims made by the Client and not to third-party claims.

To protect against third-party claims, Consultants should consider including indemnity clauses in their Contracts. Indemnity clauses do not compromise either the Client or the Consultant's position and may benefit both. These clauses should protect Consultants from claims submitted by Contractors and others due to the Consultant's negligence, errors, or omissions. Following is an example only, which should be reviewed and modified by competent legal counsel.

> "Nothing contained in this [Contract] shall create a contractual relationship with or a cause of action in favor of a third party against either the Client or the [Consultant]. The [Consultant's] services under this [Contract] are being performed solely for the Client's benefit, and no other entity shall have any claim against the [Consultant]. because of this [Contract] or the performance or nonperformance of services hereunder. The Client agrees to include a provision in all contracts with contractors and other entities involved in this Project to carry out the intent of this paragraph."[22]

6.3 Errors and Omissions Insurance

Errors and Omissions insurance defends the insured Person against allegations of negligence or wrongdoing. Such insurance protects the assets of the individual or company, considering the potential risks of a given profession, situation, or activity. In the case of a Client who has suffered damages, it ensures that there are adequate funds for compensation.[23]

It should be recognized that Errors and Omissions insurance does not enhance the quality of the finished Project. Its purpose is to fund the risk associated with errors in design or other deficiencies in the services included in the scope of assignment. In the fee negotiation process, Errors and Omissions insurance should therefore be dealt with as a separate and distinct matter.

In determining the level of insurance required, the Client should consider the level of risk associated with the execution of a Project by a competent Consultant. Prime Consultants and Subconsultants should emphasize their risk management procedures during the engagement and fee negotiation process – such as their quality control procedures in design, design checking, review during construction, shop drawing approval, and Contract administration. Upon assessing the risk, the Client and Consultant should ensure that the coverage and terms of the Errors and Omissions and

22 *Limiting Third Party Claims*, XL Insurance, available online URL: http://www.xldp.com/engineers/third.html .

23 Available online URL: http://www.encon.ca/english/ps/errors/index.html .

Professional Liability insurance are sufficient for the scope of work. Note that either the Client or the Consultant may carry the Project insurance.

APPENDIX A – TYPICAL CATEGORIES OF SERVICE

Professional engineering and geoscience Contracts must reflect the categories of services provided. Professional services are commonly categorized according to the nature of services and stages of a Project. For the purpose of determining an appropriate fee basis in the Contract (refer to Section 2), consulting services for general engineering and geoscience Projects are divided into the following categories:

- Consultative and Advisory Services
- Geological or Geophysical Services of Defined Scope
- Geological or Geophysical Services on Comprehensive Projects
- Conceptual and Pre-Design Services
- Design Services
- Contract Administration and Technical Review Services during Construction
- Resident Geoscience or Engineering Services during Construction
- Post Construction Services

Consultative and Advisory Services

Examples of this category of service are the following:

- Advice and/or assistance in obtaining Project funding.
- Appraisals and valuations based upon existing data.
- Expert testimony.
- Environmental Assessments.
- Feasibility studies including monitoring site conditions.
- Forensic engineering.
- Funding Evaluations (levies, development changes).
- Investigations (failures, accidents, groundwater, drainage, stability, etc.).
- Inspection, testing or other services concerning the collection, analysis, evaluation and interpretation of data and information leading to specialized conclusions and recommendations.
- Natural resource reserve evaluations.
- Operational Evaluations.
- Project planning and organization.
- Rate structure and tariff studies.
- Surface and subsurface assessments.
- Technical representation on behalf of a Client at meetings, as operations representative, etc.

Geological or Geophysical Services of Defined Scope

This category of assignment represents professional services for which the scope, including the quality and duration of specific services, can be established with reasonable precision. This type of assignment will not normally require analysis of alternatives or much discussion with Clients in order to optimize the services being provided. These services are characteristically routine and could be performed by a

Professional Geologist or Geophysicist, or by a technologist acting under the direct supervision of the Professional.

Services within this category are based upon established criteria, examples of which are the following:

- On-site geological or geophysical duties at a drill site.
- Supervision of geological or geophysical data acquisition, processing, and interpretation.
- Supervision of geological or geophysical laboratory work.

Geological or Geophysical Services on Comprehensive Projects

Assignments in this category can involve aspects of both 'Consultative and Advisory Services' and 'Services with Defined Scope'. However, the level of service required is more comprehensive and typically longer term. In providing such services, the Consultant is usually responsible for planning, coordinating, supervising, administering, interpreting, and reporting on a Project according to a Client's needs. The Consultant provides directly, or through sub-Contract, all or a portion of the requirements for personnel, equipment, and ancillary services. These Projects may involve some onsite work

Services within this category include the following:

- Assessment of a mineral property or oil/gas lease or play.
- Assessment of a geographic area by geological, geochemical, geophysical, or other technical means.
- Examination and recommendations regarding a geological formation at a particular geographic location.
- Exploration program management (most common in oil sands in Alberta).
- Natural resource properties requiring an estimation of "resources" (limited economic parameters defined) as well as "reserves".
- Owner's geoscientist monitoring those portions of a feasibility study surrounding resource and reserve estimation and geological modeling.
- Preparation of independent technical reports on mining and oil and gas properties, as may be required by a Stock Exchange or Securities Commission.

Conceptual and Pre-Design Services

These consist of services to establish requirements for design, including but not limited to the following:

- Investigation and exploration.
- Preliminary surface and subsurface investigation of sites - survey aspects of location that may affect the design, soil investigation and other testing, environmental evaluations, geotechnical investigations, and other site specific reviews for preliminary design decisions.
- Survey, soil investigation, and other testing.
- Analysis of conditions or methods of operation, feasibility and economic analysis, analysis of location of the Project, and similar matters undertaken to establish the sizes, capacities, locations, methods of operation and other principal features which form the basis for the design of a proposed Project.

- Preparation of preliminary estimates.
- Determination of scope of Project.
- Preparation of pre-design report covering siting alternatives, conceptual sketches, Specification notes, probable construction cost and schedule.
- Scoping software requirements – acquisition, specification, analysis, and management of software requirements.

Design Services

These services follow the establishment of Project requirements described in 'Consultative and Advisory Services' and consist of the preparation of designs, Drawings, Specifications and Contract documents. These services generally include the following:

- Preliminary Design
    - Preparation of preliminary sketches and outlined Specifications illustrating and defining the design concept in terms of siting, surface and subsurface characteristics.
    - Preparation of preliminary sketches, resolution of detailed problems, equipment selection and development of Specification notes.
    - Preparation of detailed calculations, design Drawings, and Specifications.
    - Detailed surveys, geotechnical investigations and other site-specific evaluations for detailed design decisions.
    - Preparation of preliminary design report covering preliminary sketches, outline Specifications, alternates, estimated construction cost and schedule.
    - Advice and/or assistance in obtaining approval from the authorities.
- Detailed Design
    - Preparation of design Drawings, Specifications, and detailed calculations.
    - Preparation of estimates of the cost of the work including design and construction schedules.
    - Review and coordination with other design disciplines.
    - Assistance in obtaining approval from authorities for the total Project or specific aspects of it.
    - Software design – techniques used to define and describe how the software would be built.[24]
- Consultant Selection.
- Assistance and advice to the Client during Consultant selection including proposal evaluation and award.
- Additional Design Services
    - Alternative Designs requested by the Client following completion of a normal design process in which various alternate materials and layouts are considered.
    - Redesign arising from circumstances beyond the Consultant's control.

24 *Interview and Assessment Guide for the Evaluation of Software Engineering Experience*, CCPE, 2001.

- Technical specialist input including any special services involved in the coordination of Specialist Consultants or Subconsultants.

Contract Administration and Technical Review Services during Construction

These services consist of Contract administration and periodic field visits during the construction period following the award of Contract. They include the following:

- Administration and technical aspects of the Contract.
- Review of shop Drawings as provided for in the terms of the construction Contract documents.
- Periodic visits to the site by the Consultant or authorized representative to familiarize him or herself generally with the progress and quality of the work and conformance to the Drawings and/or Specifications.
- Construction progress reports to the Client.
- Interpretation of Contract documents and technical geoscience or engineering aspects of the Contract, as required by the Contractor or Client.
- Examination of progress claims for the purpose of approving progress payments.
- Final review of construction and issue of completion certificate.

Resident Geoscience or Engineering Services during Construction

These services consist of supplying review or inspection staff on the Project to provide specific geoscience or engineering services described in the scope of assignment. The services include activities, which are designed to assist the Consultant in administering the Contract and to determine if the work is being performed in accordance with the Contract documents. If required by the Client and identified in the Contract scope of work, resident engineering/geoscience services should include the recording of all details of construction for the preparation of record Drawings. If these services are not to be provided, the Client is to provide a record of the qualified people undertaking this task and record all details of construction.

Resident engineering services may include items such as the following:

- Materials testing, quality control and review for conformance with the Contract documents.
- Informing the Consultant representative responsible for 'Contract Administration and Review During Construction' regarding quality assurance, workmanship, and progress.
- Survey layout and construction staking where this is not a Contractor responsibility.
- Quantity measurement and records.
- Inspection of construction for compliance with the Drawings and Specifications and communication with the:
  - Contractor regarding deficiencies in the work,
  - Consultant representative responsible for Contract Administration and Engineering Review During Construction, and
  - Client regarding matters of direct interest or concern.
- Records of changes from design arising during construction.
- Field resolution of construction problems and administration of extra work in consultation with the Client representative.

Resident geologist/geophysicist services may include the following:

- Independent sample collection and data verification as part of due diligence requirements for the acquisition of a mineral property.
- Independent verification of procedures during an exploration program (geological or geophysical, mining, or oil and gas).

The services described above do not include the direction of Contractor personnel in methods, scheduling or equipment selection except as may be specifically prescribed in the Contract documents, since these are normally a Contractor responsibility.

For software engineering, engineering services during construction may include the following:

- Construction and integration of the software product.
- Software process engineering – definition, measurement, and improvement of software engineering process.
- Software quality and testing – techniques to assess and ensure that the software product adheres to standards, conforms to its requirements, and meets its end user needs.
- Software assets management – safeguarding and control of the various artifacts or work products of software development, their versions, variants and the control of changes done to these work products.
- Management of software products – approaches for planning, measuring, and controlling the progress of software Projects.

Post Construction Services

The services in this category vary in scope and detail according to the needs of the Client and should be described in the scope of the assignment. They include but are not limited to the following:

- Commissioning and start-up assistance.
- Preparation of operation manual.
- Preparation of record Drawings.
- Determination of deficiencies during the guarantee period and final acceptance documentation at its expiry.
- Consultation on special problems during warranty period.
- Dispute resolution services.

APPENDIX B – CALCULATION OF FEES ON HOURLY BASIS

Sample Calculation

For fees on an hourly basis, the total cost of consulting services is typically calculated as a sum of the hourly fees plus Disbursements:

Total Cost = Σ (Hourly Billing Rates X Hours Expended) + Σ (Disbursements X Factor)

Hourly fee rates vary according to qualifications and level of experience. Rates should reflect additional authority and responsibility, such as providing responsible technical and organizational direction, and representing the professional practice to the Client. Hourly fee rates may be fixed rates for various staff categories or may be individualized for each employee. There are two main methods to calculate fees on an hourly basis: 1) flat rate or 2) multiplier method as a function of operating costs. The flat rate method is more commonly used while use of the multiplier method is not.

1) Flat Rate Method
The flat rate method may be based upon several factors including salary, utilization rates, training and support staff, and overhead such as carrying cost of the investment and operation. The hourly rate may be calculated by dividing median salaries by the annual working hours a year and multiplying by an appropriate overhead factor. Median salaries may be determined from representative salaries at various responsibility levels from the APEGGA Salary Survey (available at www.apegga.org). The Consulting Engineers of Alberta's have recommended hourly rates, which are updated annually and are available at: www.cea.ca.

2) Multiplier Method
The multiplier method calculates an hourly rate for each staff by multiplying the hourly payroll cost by a payroll factor (which is a function of operating costs). The cost components of this method may comprise the Consultant's hourly billing rates: direct payroll costs, overhead costs, and profit. However, this method is less commonly used as it can create unproductive disagreement between the Consultant and Client/Owner over the payroll factor used. APEGGA does not promote the divulging of Consultants' business information (such as payroll costs) to Clients. These calculations are provided only to assist Consultants in the calculation of their own costs and, hence, the setting of fees appropriate to their practice.

$$\textbf{Hourly Payroll Cost} = \frac{\textbf{Annual Salary + Fringe Benefits}}{\textbf{Annual Working Hours}}$$

Annual Salary = Annual salary for each employee. Refer to annual APEGGA Salary Survey (available at www.apegga.org) for representative salaries at various responsibility levels.

Fringe Benefits = 30% to 40% of annual salary to cover the employer's share of: UIC charges; Workers' Compensation levies; medical and hospitalization insurance; life, dental and other

		insurance premiums; sick leave provisions; vacation pay; Canada Pension and company pension
Annual Working Hours	=	Regular working hours per week multiplied by 52 weeks (e.g. 37.5 hrs/week * 52 weeks = 1950 hrs/yr). Actual billable hours may be used instead of regular working hours. For sole practitioners, the Annual Working Hours may be multiplied by a utilization factor (say 70-75%, or less for wellsite geologists) to estimate actual billable hours. The sole practitioner can then start from the salary he or she requires to calculate the Hourly Billing Rate.

Payroll Factor

The Payroll Factor covers overhead costs and profit. It does not cover value-added items or disbursements. The factor is typically 2.0 to 5.0 and should be agreed to at the commencement of the Project. The Payroll Factor should be based on the complexity of the work and an estimate of total person-hours for all services. A lower factor is appropriate when services are a continuation of other categories of service provided by the same Consultant or for lengthy Projects. A higher factor is appropriate for very small Projects, when man-hour demands are intermittent, or for Specialist Consulting and expert witness services.

Overhead Costs

This category of cost relates to the general operations and maintenance of a business and is usually covered by the Payroll Factor. Overhead costs vary according to the size of operation, location of office, and the nature of services provided. They vary also with the efficiency of the Consultant's organization and size of Project, but typically are approximately equal to the direct payroll costs, hence, a minimum Payroll Factor of 2.0.

As a guide, overhead costs include the following:

- office rental and operating costs
- furnishings
- usual engineering, geology, or geophysical tools and equipment (excluding specialized computer equipment such as CAD and electronic survey equipment which are covered by negotiated rates)
- switchboard, telephones, fax, word processing equipment, photocopiers
- business and professional licenses
- professional and general liability insurance
- stationery and office supplies
- technical library and periodicals
- staff recruitment, training, and severance
- audit and legal fees
- bad debts
- financing costs
- business development

- administrative salaries such as accountants and clerks, receptionists, librarians not chargeable to any one Project
- non-chargeable time by professional and technical staff in professional development, statutory holidays, vacations, updating procedures, and other activities

Profit

The level of profit should reflect the Consultant's management skills, efficiency and exposure to risk. In the long term, appropriate profit levels are an essential pre-requisite to proper Client/Consultant relations, the achievement of accepted standards of professional service, and the reinvestment in process improvements.

APPENDIX C - DISBURSEMENTS SPECIFIC TO THE PROJECT

Disbursements incurred by the Consultant in completing an assignment are properly chargeable to the Client, unless otherwise negotiated with the Client. The cost of disbursements may be expressed as:

1. Actual cost of disbursements plus a percentage
   The percentage is intended to cover the administrative handling and financing costs associated with these Disbursements. Suitable percentages range from 5%-10% depending on the magnitude and quantity of Disbursements.

2. Percentage of fees charged
   Many Disbursements, such as communication costs (phone, fax, courier, etc.), routine printing and plotting costs, routine software and computer costs are expensive for the Consultant to track and expensive for the Clients to review and verify. The billing of these Disbursements may be invoiced at an agreed upon percentage of the fees charged.

Following are examples of expenses that may be included, but not limited to, as reimbursable in all fee basis options:

- Reproduction of Drawings and documents.
- Travel expenses, vehicle use charges.
- Use of messenger and courier service.
- Computer equipment, software, and computer services support program.
- Site office equipment and supplies.
- Progress photography.
- Living expenses for personnel.
- Use of Specialist Consultants, land surveys, Subconsultants (ie., direct costs)
- Additional chemical or physical testing.
- Other similar expenses for items consumed on the Project such as survey stakes, containers, patching materials, sample molds, etc.
- Use of specialized equipment detailed in the Contract.
- Cost of any insurance that the Consultant is required by the Client to carry and that would not otherwise be carried, such as Project specific insurance.
- Advertising on the Client's behalf.
- Any other proper expense paid out by the Consultant on the Client's behalf, and not covered by the agreed fee.

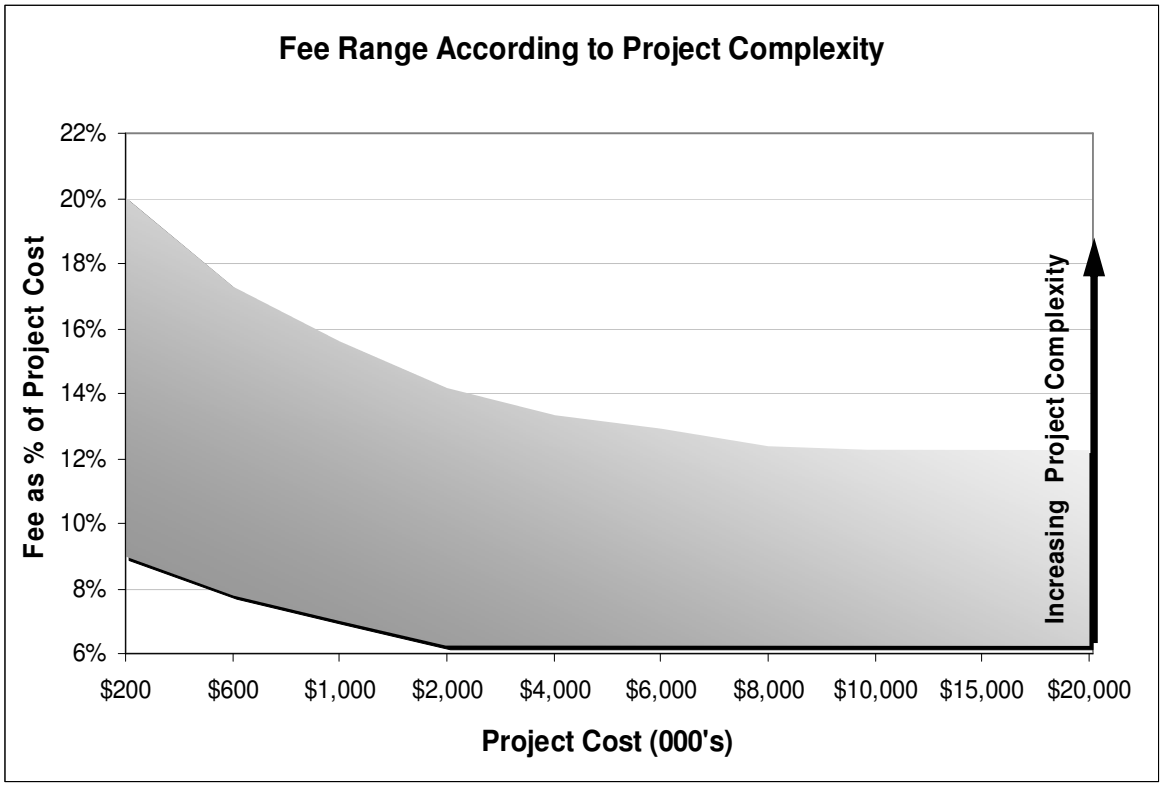
APPENDIX D – MANAGEMENT CONTRACT WITH FEES AS PERCENTAGE OF ESTIMATED PROJECT COST

Traditionally, services in detailed design, Contract administration, and 'Resident Engineer During Construction' have been provided on a fixed fee basis expressed as a percentage of Project cost. Fees for services prior to detailed design (advisory, conceptual and preliminary design), procurement, disbursements, commissioning, taxes or any conditional requirements not stated are additional.

The following graph represents data that is based on historical data. In recent years, the effects of wide swings in Project costs have introduced inequities that make this method of determining and expressing fees less appropriate - even for Projects with, historically, a predictable relationship between Consultant costs and Project costs.

Note that for small Projects (<$200,000), this graph is not applicable. In these cases, the cost of consulting services may be a higher percentage of Project costs (e.g., electronics design and manufacturing with the cost of materials being proportionally less).

It is recommended that this graph be used only as a guide and the fees be based on properly prepared cost estimates that take into account the complexity and special requirements of the Project.



Examples of Projects with lower complexity are:

- One storey industrial buildings with uncomplicated electrical/mechanical requirements
- Urban street systems, highways, or railways with no special features
- Simple straight span bridges of conventional design
- Urban water distribution and sewerage systems
- Reservoir analysis for defined petroleum and natural gas pools
- Geoscience services, including geophysical, geochemical, and geological services

Examples of Projects with higher complexity are:

- Plants, refineries, or mills with complicated mechanical, electrical, and instrument control systems
- Street systems, highways, or railways with grade separations or other special structures or geometry
- Asymmetric, curved, skewed, or continuous span bridges
- Urban water or sewerage systems involving pumping stations, deep bury, storage or other special features
- Resource exploration, exploitation, and evaluation drilling programs
- Reservoir analysis of several pools and/or regional hydro-geological investigations
- Software design and modification
- Additions to or reconstruction of Projects
- Rehabilitation or renewal Projects

APPENDIX E – REFERENCES AND SAMPLE FORMS

Standard Forms

Standard form Contracts are available for establishing a contractual relationship between the Client (Owner)/Prime Consultant or Prime Consultant/Subconsultant. There are a number of sources for standard Contracts applicable to a specific work assignment. Listed below are a few well known sources.

- American Association of Petroleum Geologists and Society of Independent Professional Earth Scientists "Contract for Geoscience Services" available URL: http://dpa.aapg.org/contgeosvcs.doc
- The Association of Consulting Engineers of Canada (ACEC), Document No. 31, "Prime Agreement between Client and Engineer".
- ACEC, Document No. 32, "Agreement between Engineer and Subconsultant".
- Canadian Construction Documents Committee's Complete Set of CCDC Contracts and Guides, available online at: http://www.ccdc.org/docs/electronic.html#contracts
- International Federation of Consulting Engineers (FIDIC) "Client/Consultant Model Services Agreement, 1991".
- National Practice Program (NPP), and the Royal Architectural Institute of Canada (RAIC), Document No. 6, "Canadian Standard Form of Agreement between Client and Architect".
- NPP and RAIC, Document No. 9, "Canadian Standard Form of Agreement between Architect and Consultant".
- The Petroleum Services Association of Canada "Master Services Agreement".

Web Sites

Alberta Association of Architects (AAA)	www.aaa.ab.ca
American Association of Petroleum Geologists (AAPG)	www.aapg.org
Association of Consulting Engineers of Canada (ACEC)	www.acec.ca
American Counsel of Engineering Companies (ACEC)	www.acec.org
Canadian Construction Documents Committee	www.ccdc.org
Canadian Society of Exploration Geophysicists (CSEG)	www.cseg.ca
Canadian Society of Petroleum Geologists (CSPG)	www.cspg.org
Consulting Engineers of Alberta (CEA)	www.cea.ca
The Construction Owners Association of Alberta (COAA)	www.coaa.ab.ca
The Encon Group	www.encon.ca
International Federation of Consulting Engineers (FIDIC)	www.fidic.org
The Petroleum Services Association of Canada	www.psac.ca
XL Capital (formerly DPIC)	www.xldp.com
Royal Architectural Institute of Canada (RAIC)	www.raic.org
Society of Petroleum Engineers (SPE)	www.spe.org

Sample Contract

The attached form is intended as a guide to APEGGA Members in drafting Client/Prime Consultant/Subconsultant Contracts. The form covers the four primary elements of a Contract — scope, schedule, fee basis and payment. Other items included are those that are commonly required in Contracts but are not intended to represent a

comprehensive list. Each assignment must be considered specifically for its own requirements.

CLIENT / PRIME CONSULTANT OR PRIME CONSULTANT / SUBCONSULTANT CONTRACT – LONG FORM

THIS CONTRACT made this *date* day of *month*, 20 *year*.

BY AND BETWEEN

_____ Client

and

_____ Consultant

WHEREAS the Client intends to engage the services of the Consultant in connection with the provision of _____ services for the *name of Project* Project.

NOW THEREFORE THIS CONTRACT WITNESSES that the parties hereby agree as follows:

[Note: If space provided under each of the articles is inadequate, indicate by notation that numbered schedules are attached as appendices.]

ARTICLE I

SCOPE OF SERVICES

1.01 Professional Services

Concise but comprehensive description of services to be provided.

1.02 Supplementary Services

Concise but comprehensive description of services to be provided.

ARTICLE II

SCHEDULE

Work will commence no later than _____*date*_____ 20 ___*year*___ and the services described in Article I will be performed in accordance with the following schedule.

Concise description of the schedule including dates of significant stages of the work.

ARTICLE III

CLIENT RESPONSIBILITIES

3.01 Information

The Client shall provide the Consultant with a written description of the Project and provide all background plans, reports and records that will be required to complete the Consulting Services.

3.02 Authority

The Client shall provide the Consultant with the authority to act as his agent, to gain entrance to property or to seek information from government and other authorities as required in the performance of the Consulting Services.

3.03 Other

Describe specific items.

ARTICLE IV

CONSULTANT RESPONSIBILITIES

4.01 Work Schedule

Describe the schedule for the main elements of the assignment.

4.02 Progress Reports

Describe scope and frequency.

4.03 Cost Estimate

Define the type and quality of estimate to be provided and any specific limitations in schedule or quality.

4.04 Other

Describe specific items.

ARTICLE V

FEE BASIS

5.01 Professional Services

The Client agrees to compensate the Consultant on the following basis:

Concise description of basis of fee – lump sum, hourly rates, or other - including any targets

5.02 Disbursements

The Client agrees to reimburse the Consultant for disbursements as described below:

Concise description including mark-ups if applicable and rates for equipment or vehicles as applicable.

5.03 Additional Services

Concise description of basis of fee or hourly rates.

ARTICLE VI

PAYMENT

Invoices including documentation for professional services and disbursements will be submitted to the Client by the Consultant at the end of each month. Invoices are due and payable on receipt by the Client and are overdue *# days* later.

Describe documentation including format and interest on overdue accounts if applicable.

ARTICLE VII

TERMINATION OF CONTRACT

7.01 By Client

Concise description of circumstances and procedures including responsibility and payment.

7.02 By Consultant

Concise description of circumstances and procedures including responsibility and payment.

ARTICLE VIII

OWNERSHIP OF DOCUMENTS

Describe ownership of originals and schedule for transmittal in relation to completion of the assignment.

ARTICLE IX

INSURANCE

Detailed description of insurance coverage to be provided.

ARTICLE X

CONFIDENTIALITY

Describe the specific undertaking, if any, to maintain confidentiality of information associated with the assignment.

ARTICLE XI

OTHER

Describe specific items such as special requirements for Arbitration.

ARTICLE XII

GOVERNING LAW

This Contract shall be governed by the laws of *province* .

IN WITNESS WHEREOF the parties hereto have executed this Contract all as of the day and year first above written.

[Client]

Per:

Per:

[Consultant]

Per:

Per: