



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES
ONTARIO

02-256

2020 Fee Guideline

GUIDELINE FOR SETTING FEES FOR CONSULTING ENGINEERING SERVICES

This document should be seen as a resource and reference document for engineering firms and clients alike. Engineering firms are encouraged to share this document with current and future clients so as to manage expectations and achieve a common understanding regarding the methods and approaches for setting fair and reasonable engineering fees and developing a budget for a project.



INTRODUCTION

The success of any project depends upon obtaining and retaining qualified and skillful engineering expertise relevant to the project goals. Selection of an appropriately qualified firm for a specific project helps to ensure a well-planned and designed, economical and successful project. Selecting a consulting engineering firm is, therefore, one of the most important decisions a client makes.

This document provides a guide for establishing fees for traditional engineering projects in Ontario. Its purpose is to provide information about approaches to fees which should normally result in appropriate compensation for:

- The professional work required to meet the necessary standards of engineering care and quality;
- The professional's obligations under the Professional Engineers Act ("the Act") and its associated regulations; and
- Continuing professional development and skills training.

The fee information identified in this document reflects the level of service professional engineers must provide to meet the standard of care identified in the Professional Engineers Ontario (PEO) practice standards and guidelines. Practice standards are found in the regulations under the Act, and practice guidelines are published by PEO and are available on their website (peo.on.ca). The standards and guidelines identify the level of effort, standard of care and due diligence a member must provide to fulfill their professional obligation under the Act, including the Code of Ethics.

Additionally, this document is intended to guide the development of adequate budgets that enhance the creation of sustainable, value added engineering services. Sustainability and providing long-term value for stakeholders is only achieved through proper planning and engineering of the entire project lifecycle. Decisions made during the planning and design phases not only determine whether or not the project delivers the intended service to satisfy the original need, but will also directly affect the entire service life—and hence cost—of the project. Reducing investment at the design stage can result in significantly higher capital, operating and maintenance costs throughout the life of the project.

Both engineers and geoscientists may use this document, since the concepts are generally relevant to both professions providing professional services on engineering and environmental projects. Aspects of this document may also be a useful reference for professional geoscientists providing services in a wide range of other fields.

The methods and approaches described in this document are only suggestions. ACEC Ontario does not recommend a specific approach and all decisions regarding the setting

of fees rests with the consulting engineering firm.

1. SELECTING A CONSULTING ENGINEERING FIRM

1.1 The Objective

The primary objective in selecting a consulting engineering firm is to retain the right consultant to provide the right services for the right reasons for the right budget. Selecting an appropriately qualified engineering firm results in good engineering designs that can significantly reduce a project's life-cycle costs. Rather than merely meeting minimum standards, the services of appropriately qualified engineering consultants can enhance a project's value to clients through rigorous consideration of alternatives, analyses of long-term operating and maintenance costs, and the application of innovative design. It is therefore in the client's best interests to use a methodology based on qualifications, which demonstrates the competence of the engineering firm in the performance of the required engineering services.

1.2 What is Qualifications-Based Selection (QBS)

QBS is a fair, transparent process, easily understood and supported by all parties to an engineering project, which ensures that opportunities to add value are not only provided for but also encouraged. Using QBS results in the selection of the most qualified and competent consultant to perform the work at a fair and reasonable price. Price-centred selection methods do not result in the best value for the project owner, and they are more prone to schedule delays and cost overruns during project execution that can far outweigh any apparent savings from selecting the lowest bidder.

1.2.1 Benefits of Using the QBS Process

- Transparency and competitiveness
- Clients have better control of the selection process
- Improved risk management and risk mitigation built into the process
- Establishment of realistic schedules and budgets
- Facilitates consistent service
- Optimization of the opportunity for lower project life cycle costs
- Fewer change orders and disputes
- Better life-cycle value
- Promotes stronger business relationships between the parties
- Enables the engineering firm to provide better service, better quality and better value

1.3 QBS Process

1.3.1 Request for Qualifications

The QBS process begins with the issuance of a Request for Qualifications (RFQ). The RFQ sets out in writing the general scope and expectations of the client in a manner that will enable consulting engineering firms to assess their interest and their suitability for the assignment. In the RFQ, the client describes the general scope of services for the assignment, including any special project or client requirements. The RFQ should take the form of a brief, nontechnical written statement of what the assignment will include.

It should also advise consulting firms that there will be a subsequent Request for Proposals (RFP) for the assignment, issued only to a short list of the firms deemed most qualified.

The client prepares a list of consulting firms believed to have the requisite qualifications for the assignment. The size of the list should reflect the value of the assignment, (with a maximum of 10 to 12). The client invites those firms to submit their qualifications and availability for the assignment in response to the RFQ. Upon receipt of responses, the client evaluates and ranks the firms, performs reference checks and short-lists three to five consultants. Small or specialized assignments may use an alternative process.

1.3.2 RFP from Short List

The next step is to obtain detailed information from the short-listed firms invited to participate in the assignment, to enable the client to select the firm best suited for the assignment. The client must define the scope of services in sufficient detail to enable the consulting firms to submit project-specific proposals. In addition, any proposed contract terms and conditions (e.g., risk allocation, indemnification) should be specified by the client within the RFP. The short-listed firms from the RFQ are requested to submit proposals to complete the assignment. Proposals should include methodology and options, design alternatives, assignment personnel, preliminary schedule, the basis for fee negotiations and evaluation criteria. Proposals should also address the proposed contract terms and conditions. Fees and pricing are not a part of this step. Proposals are received, evaluated, and ranked by the client.

1.3.3 Jointly Define Scope with Preferred Firm

The client and the first-ranked consulting firm jointly finalize the scope of services to ensure a common understanding of the assignment. That is, they finalize an agreement on the scope of services upon which the

firm will be retained and remunerated. The client and consulting firm scope the project in detail, review and assess options and innovations to be explored, lifecycle cost comparisons to be developed, the involvement of the consultant in project processes, approvals and documentation, etc.

1.3.4 Negotiate Fee Based on Scope

The next step is to negotiate the consulting firm's fees and determine how the firm will be paid based on the agreed scope of services. The end product of this step is a client-consultant agreement. The client and consulting firm work jointly to fine-tune the scope of services and negotiate fee revisions until an agreement is reached on project scope and fees.

The negotiation should include consideration of how the project's design risk will transfer to the consulting firm. Consider setting out a payment schedule and provisions related to deliverables to minimize administrative needs. If an agreement cannot be achieved, the client undertakes the negotiation process with the second-ranked firm. This process is continued until an agreement is reached.

1.3.5 Award Contract Based on Scope and Fee

The client and consulting firm finalize the formal consulting contract for the agreed project scope and fee estimate. The consulting contract is signed. The client notifies and thanks unsuccessful firms for their submissions and effort in preparing same.

1.4 Additional Resources

ACEC QBS website – <http://yes2qbs.com/>

QBS Canada - Qualifications-Based Selection (QBS): Best Practice for Architecture, Engineering and Construction Management/General Contractor Procurement in Canada - <http://www.qbscanada.ca/media.html>

InfraGuide – Selecting a Professional Consultant – https://fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf

Analysis of Issues Pertaining to Qualifications-based Selection – research report – https://www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf

PEO – Guideline for the Selection of Engineering Services – <https://www.peo.on.ca/sites/default/files/2019-09/GuideSelectionEngSer2010.pdf>

2. METHOD OF REMUNERATION

The method of remuneration for engineering fees for a project can be based on a number of possible approaches. The most common methods include one or more of the following:

- Time Basis
- Fixed Fee
- Percentage Cost of Construction

The method selected will depend largely on the stage of the project, its complexity, and how well it is defined. The following table shows the suggested method of remuneration associated with various categories of service. Details regarding the definition of the various categories can be found in Appendix A to this guideline.

Table 2.1 - Schedule of Preferred Method of Remuneration for Building Engineering

Category of Service	Remuneration Method
Advisory Services	Time Basis
Preliminary Design	Time Basis
Design Development and Contract – Final Design	Any of the three methods
Construction	Any of the three methods
Resident Engineering	Any of the three methods
Project Management	Time Basis
Construction Management	Time Basis

2.1 Time Basis

For a time-based fee, the client is billed for the number of hours worked at agreed hourly rates for various categories of individuals. The hourly rates are established by the consulting engineering firm. The Time Basis method is recommended when the scope of engineering services is difficult to determine or cannot be determined, is not well defined, or when the consulting firm is not in total control of the required time and disbursements at some stage of the project.

All time expended on the assignment is billable, including travel, time in the consulting firm's office and time on the client's premises or elsewhere. This billable time also applies to technical and clerical services including, but not limited to, scheduling and clerical staff engaged in producing correspondence and documents such as reports and specifications.

A variation of the Time Basis method that a client may seek is to include an "upset limit" on the time-related fee budgets. To develop the upset limit, assumptions are made based on limited information available at the time. The use of upset limits is discouraged, as it does not promote optimal solutions because it results in the consulting firm

defining tasks prior to proper planning and prior to a clear definition of the project. In addition, incorporating an upset limit leads to the consultant closely monitoring changes to their originally defined scope to remain within the limit, which was initially poorly defined.

Hourly rates are appropriate for all categories of work, irrespective of how the scope of services is established. The hourly rates can be based upon several factors including salary, utilization rates, training and support staff, and overhead, such as carrying costs and profit. Hourly rates will vary according to the qualifications and level of experience and should reflect the authority and responsibility associated with each category of engineering team member involved in the project or assignment. Appendix B contains explanations about the responsibility levels often listed for professional engineers. Hourly rates may be fixed for different staff categories or may be individualized for each individual assigned to the project.

In determining specific hourly rates, each firm will have its own policies and procedures. The proposed rates will typically factor in variables such as vacation days, sick days and professional development days. Typically, in addition to the fees generated based on the hours billed, disbursements are billed at cost plus a contractually agreed mark-up.

Special Expertise

Principals, senior officers and staff rendering individual services for which they are eminently qualified, such as providing expert testimony for legal proceedings, should be billed at a factor of between 1.75 and 2.25 times the otherwise established hourly rates.

Salary Adjustments

Salary adjustments during the life of a project are normally reflected in adjustments to charge out rates unless noted otherwise within the agreement. The consulting engineering firm should specify in the contract how fees/rates will be indexed or adjusted year to year during the term of the agreement.

2.2 Fixed Fee

A fixed fee, or a lump sum fee, is a quoted price for undertaking a project or assignment that will not change, except as provided for in the agreement. It is not a method for developing a fee; rather, it is a means of providing cost certainty for both the client and the consulting firm. This approach should only be considered within the context outlined herein.

If a fixed fee is contemplated, it is imperative that the project scope be fully and completely defined and that both the client and the consulting firm have a clear understanding of expected outcomes. This is best achieved by jointly developing the scope of services. The consulting firm is then able to determine the level of effort necessary to complete the scope of services and quote an appropriate fixed fee. Establishing a fixed fee that responds directly to the mutually understood scope of services will produce a fair and cost-effective outcome. Claims for extras need only be dealt with in circumstances where the client agrees to modify the agreed-upon scope or when site conditions vary significantly from those anticipated when the scope was set. This change in scope may be initiated by the client or may result from unforeseen requirements or circumstances that may arise during project execution.

Disbursements may or may not be included in the fixed fee.

2.3 Percentage of Cost of Construction

Choosing a fee based on the percentage of cost of construction may be suitable for engineering design services where the cost of the consulting engineering service is a function of the construction or installation costs, and where the project scope and construction or installation budgets are well defined. Where the cost of construction for the project is under \$1,000,000, methods other than percentage of cost of construction should be used since the engineering fee would be disproportionate to the construction cost because of fixed costs on the part of the consulting firm.

In situations where changes to scope and/or services are made at the request of the client or in response to circumstances beyond the consulting firm's control after the project has commenced, the fee for the additional services should be based on hourly rates or as otherwise negotiated between the client and the consulting firm. Rates and basis for payment in these situations should be included in the contract terms.

For Buildings projects, the fees for full time resident engineering services are determined in addition to fees calculated as the percentage of cost of construction method. For these projects, when full time resident engineering services are required, a Time Basis is recommended. Accordingly, separate tables identifying typical ranges for percentage of cost of construction values have been created for Buildings, and for Transportation & Infrastructure, as shown in Tables 3.1 and 3.2 in Section 3.

Client Agreements should clearly define whether the cost of construction is based on an estimate established at commencement of a project or on the completed actual construction cost.

Cost of Construction for Engineering Projects

The cost of construction includes the following:

- The total cost of all materials, equipment and labour (including duties and taxes (including HST), subcontractors' and general contractors' overhead and profit) necessary to complete the work for which the consulting engineering firm prepares drawings and specifications or for which the firm is responsible to the client.
- In circumstances where the client furnishes material, equipment, services or other labour that is incorporated in the work, the cost of construction includes the fair market value of those materials or equipment as if newly purchased. In addition, the cost of construction includes the current prices of labour or other services at the time of construction. In the event construction does not proceed, market prices at the estimated time of construction would prevail.
- In circumstances where the client or contractor furnishes used material or equipment at the client's request, the cost of construction includes the fair market value of those materials or equipment as if newly purchased.
- In the event that there is a construction manager instead of, or in addition to, a general contractor, the construction manager's fee is included in the cost of construction.
- Fee budgets are based on the cost of construction including all extras to the construction contract. No deduction should be made from the consulting firm's fee because of penalties or damages claimed by the client from the contractor or other sums withheld from the contractor. The cost of construction does not include professional fees and reimbursements payable to the consulting engineering firm.

Disbursements may or may not be included in the percentage of cost of construction fee.

2.4 Other Methods

There are other fee basis methods that are utilized occasionally for engineering work. In general, these methods are project-specific and require specialized experience in their application.

Value-added

With this method, the fee is determined as a percentage of a project's anticipated savings resulting from innovative or creative design solutions or from design solutions incorporating the consulting firm's proprietary knowledge.

This method requires a clear understanding and definition of "normal" expectations against which innovative or proprietary approaches can be measured. It requires the relationship between the client and the consulting firm to be based on trust, and is best suited to projects on behalf of long-term, repeat clients. This method has the potential to generate more than the "normal" fee for detailed design services. As an example, the consulting firm's innovative thinking and evaluation of alternative design solutions during pre-design may identify opportunities to beneficially impact major construction costs and/or long-term operations and maintenance costs for the client. This would justify increased remuneration to the consulting engineering firm.

Profit Sharing

The profit sharing method of determining fees for engineering services bases the fee on a percentage of profits, either estimated or long-term actual, accruing from the completed project or assignment. This method presumes there is a potential for profit. To avoid disputes, this method requires the agreement to include a clear, detailed and mutually agreed definition of "profit" and the nature of the accounting processes used to calculate it. This method is appropriate for use by consulting firms who are able to adequately assess the risks associated with a project and who have the financial backing to engage in such business arrangements.

Equity Participation

Using the equity participation method, the consulting firm exchanges the value of fees for an equity stake in the project. The equity may provide for full or partial compensation. The firm will require adequate capital to support his or her fee contribution to participate in projects in this manner.

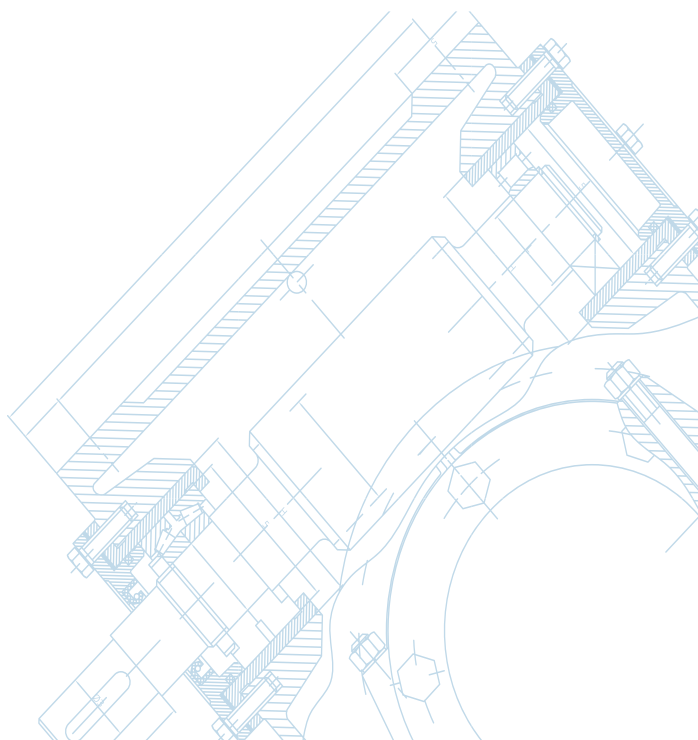
Performance-based

Performance-based remuneration is a two-tiered payment method that provides a "basic" payment for design services, plus a bonus based on predetermined levels of performance, such as:

- Completion ahead of schedule;
- Reduced approval times;
- Lower construction costs; and
- Lower operation and maintenance costs

In addition to bonuses, the performance-based method of determining fees can also involve the application of penalties. This method differs from profit sharing and

equity participation in that the entire remuneration does not necessarily depend on overall project success but on meeting or exceeding defined performance targets.



3. SCHEDULES OF REMUNERATION

3.1 Time Basis

As noted in Section 2, a time-based fee is predicated on the consulting firm billing the client for the number of hours worked at an agreed hourly rate. This fee method is especially appropriate in situations when the scope of services and/or schedule cannot be clearly defined in advance. Rather than commit to an upset limit for unknown risks, it is recommended that the consulting firm track hours and fees and provide the client with regular status and fee reports, including updated forecasts through to completion of the project. Hourly rates will vary according to qualifications and level of experience and should reflect the authority and responsibility associated with each professional engineer involved in the project or assignment. Hourly rates may be fixed for different staff categories or may be individualized for each person assigned to the project.

All time expended on the assignment is billable unless noted otherwise by agreement. The billable time also applies to technical and clerical services including, but not limited to, scheduling, and clerical staff engaged in producing correspondence and documents such as reports and specifications.

It is recommended that consulting firms provide project hourly rates not directly based on multipliers of salary. The Office of the Information and Privacy Commissioner has advised that the practice of disclosing salary multipliers to clients is not reasonable if a less privacy-intrusive practice can be used. Divulging salary information related to specific staff may contravene the Privacy Act.

The practice of basing fees on salaries is not common outside of the consulting engineering sector. For example, the legal and medical professions have a long-accepted history of using predetermined prices for defined tasks, resulting in a less privacy-intrusive approach.

As described in Section 2, salary adjustments during the life of a project should be reflected in adjustments to the charge out rates unless noted otherwise by the agreement.

In determining hourly rates, engineering firms may wish to consider the median salaries contained in the 2017 National Engineering Compensation Survey, produced by the Ontario Society of Professional Engineers, and industry standard multipliers. Appendix B contains descriptions for classifications of responsibility, experience and training for the various responsibility levels listed noted in that Survey.

3.2 Percentage of Construction

The ranges of percentages shown in Tables 3.1 and 3.2 were developed on the basis of historical data reported by PEO and on survey data received from professional engineers and clients. The ranges of percentages, when multiplied by the construction cost, should provide fair and equitable compensation for engineering detail design services. The ranges of percentages in these Tables apply to engineering as a prime consultant for projects in undeveloped areas where complexity is not introduced by existing structures. An additional fee should be negotiated for services related to demolition work. These ranges of percentages do not include allowances for the phasing of the project during design or construction, and do not reflect contract administration and/or project management services.

As stated in Section 2, for the purpose of calculating fees, "construction cost" means the contract price(s) of all elements of the project designed by, or on behalf of, the professional engineer, including the general contractor's overhead and profit and all applicable taxes, except HST. Where there is no contract price for all or part of a project, the construction cost should be estimated by the professional engineer and agreed to by the client.

In cases where changes are made at the request of the client or in response to circumstances beyond the consulting firm's control after the project has commenced, the negotiated agreement should specify the rates/fees and basis of payment for the additional services.

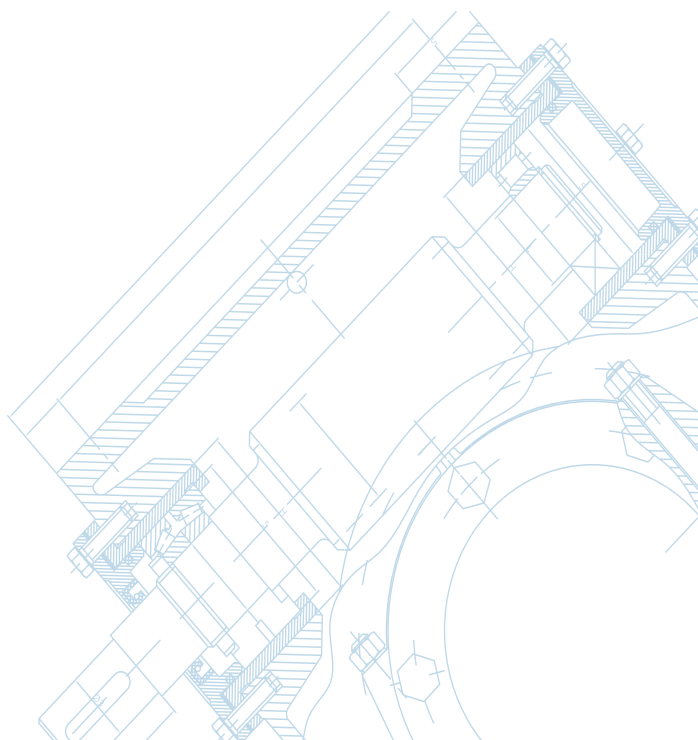
Disbursements are not included in the ranges of percentages in Tables 3.1 and 3.2. These ranges are suggestions only based on historical data.

Table 3.1 - Typical Fee Ranges as a Percentage of Construction Cost for Transportation & Infrastructure

Cost of Construction	Percentage
Less than \$1,000,000	A method other than fees as a percentage of construction costs should be used
\$1,000,000 - \$2,000,000	8.0 - 9.0
\$2,000,000 - \$5,000,000	7.5 - 8.5
\$5,000,000 - \$10,000,000	7.0 - 8.0
Over \$10,000,000	6.75 - 7.25

Table 3.2 - Typical Fee Ranges as a Percentage of Construction Cost for Buildings

Cost of Construction	Percentage
Up to \$125,000	A method other than fees as a percentage of construction costs should be used
\$125,000 - \$250,000	10.28 – 15.75
\$250,000 - \$500,000	10.00 – 15.28
\$500,000 - \$1,000,000	9.55 – 15.06
\$1,000,000 - \$2,000,000	9.10 – 13.84
\$2,000,000 - \$4,000,000	8.30 – 12.86
\$4,000,000 - \$8,000,000	7.25 – 11.85
\$8,000,000 - \$16,000,000	6.10 – 10.60
\$16,000,000 - \$32,000,000	5.10 – 9.60
Over \$32,000,000	Percentage to be negotiated



4. DISBURSEMENTS

The terms “Disbursements” and “Reimbursable Expenses” are often used interchangeably.

The client should carry a reimbursable expenses allowance in the project budget, typically in the range of 6% to 8% of the total fees. In this way, estimates of reimbursable expenses do not become a factor in selection of the consulting engineering team since reimbursable expenses are expected to be similar among consulting engineers for the same scope of work. As part of the negotiations process, the client and the consulting firm should review the projected expenses prior to the start of the project and agree on the applicable disbursements category and reimbursement methods. There is no generally agreed approach to this among consulting engineering firms and the information in this section is provided for guidance only.

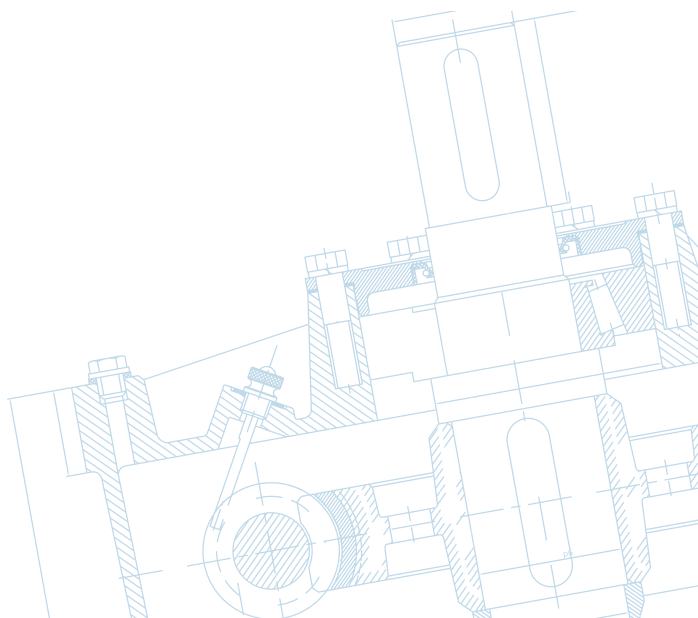
Minor disbursements are normally part of a consulting firm’s overhead costs and are typically not charged separately. These types of disbursements may include the following items:

- Local and long-distance telephone costs;
- Routine production of drawings and documents;
- Local travel expenses (up to 50 km from office);
- Standard software and computer costs; and
- Office supplies.

When disbursements are not included as part of the fee for engineering services, compensation may be based on billings for individual items of expense, an agreed lump-sum payment, or as a percentage of the total fee. These other disbursements may include the following items:

- Travel beyond the local area, or vehicle rental and fuel costs;
- Living expenses for personnel approved by the client;
- Project-related advertising costs;
- Specialized, project-specific computer software and/or services;
- Use of specialized equipment;
- Testing services;
- Courier delivery services;
- Approvals, permits, licences, and specific taxes applied to fees;
- Project-specific insurance if required by the client;
- Any other third party expenses paid by the consultant on the client’s behalf; and
- Tender documents and other non-routine documents.

Sub-consultant invoices are recommended to be charged at cost plus 10-15 per cent to address the consulting engineer’s overhead and administration costs.



5. OTHER FEE CONSIDERATIONS

5.1 Retainers

A retainer is a lump sum amount paid by the client to the consulting engineering firm in advance of work starting, to cover anticipated work up to a maximum number of hours. Retainers are most often used when the client requires consulting engineering services on an ongoing, on-call basis. Retainers can also be utilized when the detailed scope of work has not been fully defined or is expected to vary significantly as the work progresses. The retainer is payable upon execution of the agreement between the consulting firm and the client and establishes the minimum payment under the contract. Funds are not normally returned to the client if the maximum number of hours is not reached. At the same time, if the actual number of hours of work and corresponding professional fee exceeds the retainer amount, the additional time is charged at a mutually agreed rate based on the level of staffing responsibility employed by the consulting firm undertaking the work (see Section 2 – Time Basis).

5.2 Extra Work

Extra work is best understood as work required beyond the agreed scope of an assignment. It may be the result of changes recommended by the consulting firm, or it may be the result of changes in the requirements of the client. Hourly rate fees and basis of payment for extra work should be established within the contract or such other basis as mutually agreeable to the client and the consulting firm.

A provision for extra work, including change orders, should be included in any agreement for consulting engineering services. Changes in fees, whether the result of agreed or unanticipated changes to the scope of services, should be communicated in writing and should include reasons for the change.

The following are some common examples of extra work that necessitate additional fees being negotiated:

- a) Changes to the client's program of requirements (increase or decrease);
- b) Changes to the project size, scope, quality, or complexity;
- c) Changes to the client's construction budget;
- d) Changes to the client's schedule;
- e) Changes to the project delivery method or the form of construction, and
- f) Unforeseen site conditions resulting in changes to the project.

5.3 Multiple Construction Contracts

Where multiple construction contracts are contemplated for a single project, the client and consulting firm should make provision during the fee negotiations for related additional services. Separate contracts that are contemplated in order to "fast-track" a project, for example, may require additional work from the consulting firm and should be compensated accordingly. If this requirement is not identified until after fees are agreed upon, the additional work should be addressed as extra work (refer to Section 5.2 above).

5.4 Terms & Conditions

All assignments should be formalized with an agreement for engineering services, which documents the terms and conditions under which the project or assignment will be performed. Work should not be commenced without a written agreement in place.

The size and complexity of the assignment influences the nature of the agreement. However, a signed agreement is as important for small, routine projects as it is for large and complex projects. A simplified engineering services agreement should be suitable for most small, routine projects.

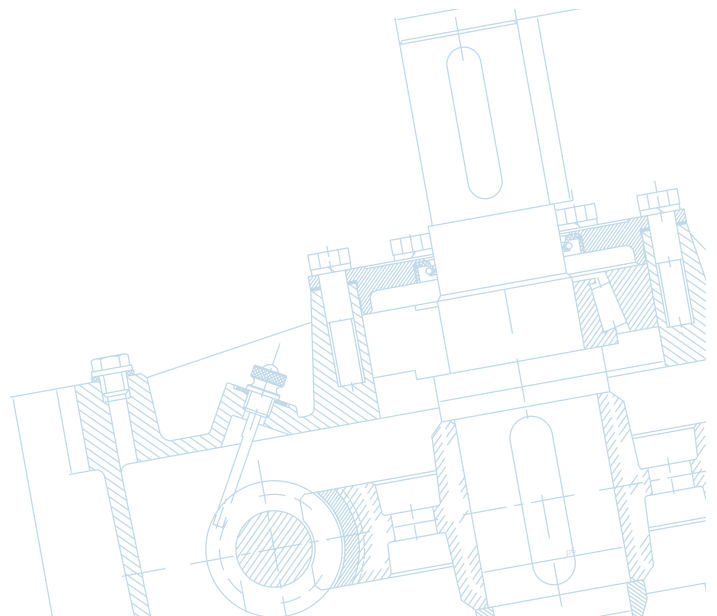
There are model agreements that have received appropriate legal oversight that can be used, and these typically include:

- Definition of words and terms
- Details of the scope of services and timetable
- Identification of specific services that are outside the scope of the agreement
- Change order process
- Client obligations
- Details of the basis of fee calculations and disbursements, as agreed upon, and payment terms, including indexation or revision mechanisms for the rates and fees
- Clear identification of the performance standard and duty of care
- Details regarding the ownership of drawings and other intellectual property
- Specific insurance and indemnity requirements, including limitations of liability and limitation on the nature of claims
- Intellectual property rights
- A dispute resolution process
- Contract termination provisions
- Details of any other conditions that may be applicable to the assignment and are agreed to by the parties

Sound and insurable agreements serve the best interest of both the client and consulting engineering firm. Consulting firms are strongly encouraged to review insurance requirements with their prospective client and with appropriate professional advisors before signing any agreement.

Liability insurance, indemnity issues and limitations of liability are basic requirements that should be addressed in all agreements for consulting engineering services. These issues can be complex and are ever-changing. Insurance requirements may be stipulated by specific legislation, by client requests and/or by the industry sector in which the consulting engineer is working. Similarly, ownership of work product (e.g., drawings, specifications, and other intellectual property) is a significant issue for consulting engineers and needs to be addressed clearly and specifically in the agreement.

There are various standard forms of agreement available for use by engineering firms and clients, including the one produced jointly by CEO and the Municipal Engineers Association (MEA). The current version of the MEA/CEO Client/Engineer Agreement for Professional Consulting Services, 2019, is located on CEO's website at ceo.on.ca. This form of agreement is tailored to municipal projects. A more generic form of agreement is available from the Association of Consulting Engineering Companies – Canada (ACEC). The ACEC 31 (2010) document, Engineering Agreement between Client and Engineer, is available from the ACEC website at acec.ca. Lastly, the Canadian Construction Documents Committee (CCDC) has adapted the ACEC 31 document and will be publishing it as CCDC 31. It will be available for purchase from the CCDC website at ccdc.org. In addition to these standard forms of agreement, many consulting engineering firms develop and maintain their own forms of agreement, as do many buyers of consulting engineering services. CEO endorses the MEA/CEO agreement and the ACEC 31 agreement. Standard forms of agreement supplied by a client should be reviewed carefully before being signed by the engineering firm.



APPENDIX A - PROFESSIONAL ENGINEERING SERVICE CATEGORIES

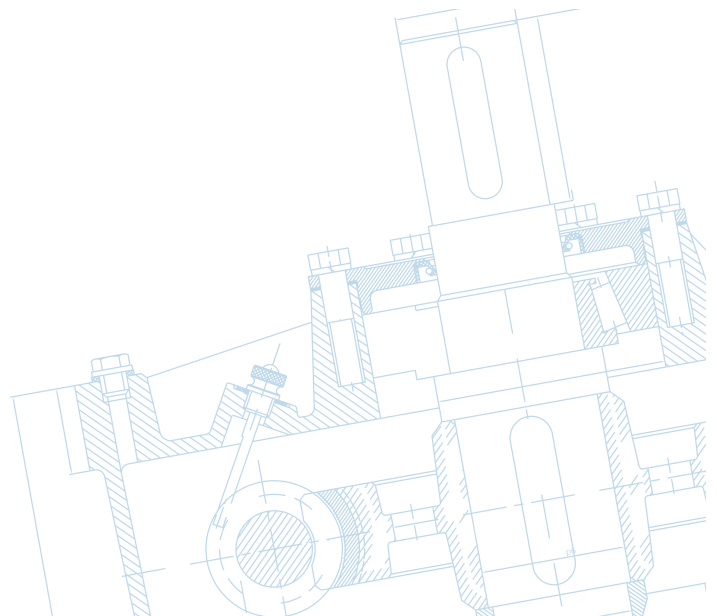
The purpose of this appendix is to enable a client and a professional engineer to identify a starting point in the process of establishing the scope of professional engineering services required to meet the client's needs and to establish a basis for remuneration. In all situations, the consultant must ensure that the scope of services does not include, nor give the appearance of, the provision of legal-type services. It should be noted that the engineer's provision of advice, guidance and recommendations are from a technical and project management perspective and do not constitute legal advice.

Category	Definition
Advisory Services	<ul style="list-style-type: none"> • Insurance and other claims assistance • Pre-design, planning and feasibility studies of client's needs, analysis of conditions or methods of operation, development of alternative concepts, economic analyses, site location and site condition studies, and similar matters undertaken to establish sizes, capacities, locations, methods of operation and other principal features determining a proposed project's feasibility • Client representation at meetings and hearings • Dispute resolution services • Safety engineering • Appraisals and valuations • Engineering cost estimates • Economic analysis • Evaluation of alternative design concepts and similar matters undertaken to establish the sizes, capacities, locations, methods of operation, operating costs and other principal features that form the basis for conclusions and recommendations on the design and undertaking of a project • Environmental studies and assessments • Analyzing the functional requirements of systems, equipment, facilities, procedures and supplies to identify essential functions • Analysis of alternatives to achieve the best overall project value and to eliminate unnecessary costs in a project • Life cycle cost analysis • Expert testimony • Accident investigation and reconstruction • Analyzing, evaluating and assessing engineering infrastructure failures • Asset planning and management, including analysis of ownership and operation options • Operations management systems planning and related technologies • Operations and maintenance management services • Technology advice and issues related to designing, managing or implementing computer and software systems for engineering applications • Staffing and organizational planning advice Infrastructure assessment • Emergency response and contingency planning

Preliminary Design	<ul style="list-style-type: none"> • Reviewing and refining project scope; reviewing alternative conceptual proposals; preparing preliminary design reports, sketches, schematics, specification notes; detailed scheduling Investigative surveys, such as site survey, geotechnical and hydrological investigations and other tests • Analysis of conditions or methods of operation Life cycle costing • Statement of probable costs, documentation for financing and detailed cost estimates • Environmental impact assessments • Permits and licences • Revision of existing designs • Investigative services
Design Development & Contract - Final Design	<ul style="list-style-type: none"> • Preparing working drawings and supporting detailed calculations • Resolving design issues • Selecting technical equipment and developing related specifications Coordinating consultants and/or other design services groups • Preparing specifications, tender documents and contract documents; managing the tendering • process and assisting and advising the client on tender call, evaluation and award • Preparing, or collaborating with others responsible for preparing, detailed estimates of the cost of the work • Preparing performance specifications and designs for design/build projects • Pre-construction services such as reinforcing bar schedules, fabrication drawings, pre-qualification of contractors, fast-track construction and/or sequential tendering
Construction	<p>Presumes contract administration services will be provided by the professional engineer, who will protect the client's interests and ensure conformity by the contractor with the design.</p> <ul style="list-style-type: none"> • Arranging for and attending regular site meetings and attending job-site meetings, when requested Reporting to the client on the work's progress, including the contractor's adherence to the construction schedule and the potential impact on costs • Investigating and reporting any unusual construction circumstances • Reviewing shop drawings for general compliance with design requirements and contract documents Providing on-site staff to monitor and inspect the contractor's work, such as assessing the progress of the work and the works conformity with the contract documents, quality assurance checks, field testing of materials and equipment • Advising the client and contractor of defects or deficiencies Change order management and recommendations to the client • Interpreting contract documents for the contractor or the client and issuing supplementary details and instructions as required • Reviewing contractor's progress claims, including the validity of additions or deletions; issuing progress certificates and change orders for the client's acceptance; making progress payment recommendations • Co-ordinating the preparation of as-built drawings; periodically reviewing the as-built drawings kept by the contractor; advising the client on their adequacy • Final testing and commissioning of work prior to certification • Carrying out final review at the conclusion of the construction contract and issuing the Substantial Performance certificate • Issuing Total Performance certificate • Year-end warranty review and advice to the client

	<ul style="list-style-type: none"> • Advising the client and contractor of defects or deficiencies • Change order management and recommendations to the client • Interpreting contract documents for the contractor or the client and issuing supplementary details • and instructions as required • Reviewing contractor's progress claims, including the validity of additions or deletions; issuing progress certificates and change orders for the client's acceptance; making progress payment recommendations • Co-ordinating the preparation of as-built drawings; periodically reviewing the as-built drawings kept by the contractor; advising the client on their adequacy • Final testing and commissioning of work prior to certification • Carrying out final review at the conclusion of the construction contract and issuing the Substantial Performance certificate • Issuing Total Performance certificate • Year-end warranty review and advice to the client
<p>Resident Engineering</p>	<p>"Resident services" are typically used when a client retains the professional engineer to provide Construction Services, as set out above.</p> <ul style="list-style-type: none"> • Providing reference surveys to the contractor (not including surveys of legal property boundaries) and, where necessary, checking the contractor's surveys • Determining that the contractor's work satisfies the intent of the design and conforms to the plans and specifications • Arranging for and/ or carrying out all prescribed field testing and inspection of materials and equipment • Investigating, reporting and advising on unusual circumstances that may arise during project implementation • Carrying out final inspection at the conclusion of the contract, including any elements of commissioning agreed to as part of the client's acceptance program • Maintaining a daily diary and other work tracking processes, as necessary to monitor work progress Certify the contractor's requests for progress payments, quantities of work completed, materials delivered to the site, change orders and the like. <p>Notes: Field services do not include directing the contractor's personnel in methods, scheduling, procedures, sequence of work, equipment selection or job site safety, except as may be specifically prescribed in the professional engineer's scope of services.</p> <p>On-site office facilities, if required, are provided typically provide by the contractor or client. Staff assigned by the professional engineer may be on-site full time for a continuous work period, as required by the needs of the project, or as otherwise agreed between the parties.</p>

<p>Project Management</p>	<p>Provision of services for the successful delivery of a client's project to meet the client's requirements of function, quality, budget and schedule. Project management services may include, but are not limited to:</p> <ul style="list-style-type: none"> • Selecting professional engineers • Economic analysis and feasibility reviews • Planning, scheduling, monitoring and controlling • Estimating, budgeting and cash control • Engineering and design • Arranging financing • Procurement • Risk management • Value engineering • Partnering • Construction management • Commissioning • Quality assurance • Approvals and permitting
<p>Construction Management</p>	<p>These services may include, but are not limited to:</p> <ul style="list-style-type: none"> • Contract strategy, administration and expediting • Partnering • Construction logistics, such as planning, scheduling and human resource forecasting Labour relations • Field office management, including temporary facilities Materials receiving and warehousing • Progress and trend monitoring and reporting Claims processing • Project safety



APPENDIX B - PROFESSIONAL SERVICES ROLE DESCRIPTIONS

Level	Roles & Responsibilities
A	Receives training in the various phases of office, plant, field or laboratory engineering work as classroom instruction or on-the-job assignments. Tasks assigned include: preparation of simple plans, designs, calculations, costs and bills of material in accordance with established codes, standards, drawings or other specifications. May carry out routine technical surveys or inspections and prepare reports. Few technical decisions called for and these will be of routine nature with ample precedent or clearly defined procedures as guidance. May assign and check work of one to five technicians or helpers. Does not supervise junior engineers.
B	Normally regarded as a continuing portion of an engineer's training and development. Receives assignments of limited scope and complexity, usually minor phases of broader assignments. Uses a variety of standard engineering methods and techniques in solving problems. Assists more senior engineers in carrying out technical tasks requiring accuracy in calculations, completeness of data and adherence to prescribed testing, analysis, design or computation methods. Recommendations limited to solution of the problem rather than end results. Decisions made are normally within established guidelines. May give technical guidance to one or two junior engineers, or technicians, assigned to work on a common project.
C	This is typically regarded as a fully qualified professional engineering level. Carries out responsible and varied engineering assignments requiring general familiarity with a broad field of engineering and knowledge of reciprocal effects of the work upon other fields. Problems usually solved by use of combination of standard procedures, modification of standard procedures, or methods developed in previous assignments. Participates in planning to achieve prescribed objectives. Makes independent studies, analyses, interpretations and conclusions. Difficult, complex or unusual matters or decisions are usually referred to more senior authority. May give technical guidance to engineers of less standing, or technicians assigned to work on a common project. Supervision over other engineers not usually a regular continuing responsibility.
D	This is the first level of direct and sustained supervision of other professional engineers OR the first level of full specialization. Requires application of mature engineering knowledge in planning and conducting projects having scope for independent accomplishment and coordination of the difficult and responsible assignments. Assigned problems make it necessary to modify established guides, devise new approaches, apply existing criteria in new manners, and draw conclusions from comparative situations. Recommendations reviewed for soundness of judgment but usually accepted as technically accurate and feasible. Involved with progressively larger financial decisions. Assigns and outlines work; advises on technical problems; reviews work for technical accuracy, and adequacy. Supervision may call for recommendations concerning selection, training, rating and discipline of staff.
E	Usually requires knowledge of more than one field of engineering OR performance by an engineering specialist in a particular field of engineering. Participates in short and long range planning; makes independent decisions on work methods and procedures within an overall program. Originality and ingenuity are required for devising practical and economical solutions to problems. May supervise large groups containing both professional and nonprofessional staff; OR may exercise authority over a small group of highly qualified professional personnel engaged in complex technical applications. Makes responsible decisions not usually subject to technical review on all matters assigned except those involving large sums of money or long-range objectives. Takes courses of action necessary to expedite the successful accomplishment of assigned projects. Responsible for some financial decisions. Outlines more difficult problems and methods of approach. Coordinates work programs and directs use of equipment and material. Generally makes recommendations as to the selection, training, discipline and remuneration of staff.
F	Usually responsible for an engineering administrative function, directing several professional and other groups engaged in interrelated engineering responsibilities; OR as an engineering consultant, achieving recognition as an authority in an engineering field of major importance to the organization. Independently conceives programs and problems to be investigated. Participates in discussions, determining basic operating policies, devising ways of reaching program objectives in the most economical manner and of meeting any unusual conditions affecting work progress. Makes responsible decisions on all matters, including the establishment of policies and expenditure of large sums of money and/or implementation of major programs, subject only to overall company policy and financial controls. Reviews and evaluates technical work; selects, schedules, and coordinates to attain program objectives; and/or as an administrator makes decisions concerning selection, training, rating, discipline and remuneration of staff.

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