



**GUIDELINES FOR
MUNICIPAL
ENGINEERING SERVICES**

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GUIDELINES FOR MUNICIPAL ENGINEERING SERVICES

1.0 INTRODUCTION

1.1 PURPOSE OF GUIDELINES

The "Guidelines for Municipal Engineering Services" have been prepared by a sub-committee of Professional Engineers and Geoscientists Newfoundland & Labrador (PEGNL) and have been adopted by the Council of PEGNL.

The Guidelines have been prepared to set out the standards of practice which *Members* should meet and follow in providing professional engineering services. PEGNL and its Council have a commitment to establish standards for the quality of the services *Members* provide to *Clients* and the public, and have published these Guidelines for that purpose.

A *Member* must always exercise professional judgement in providing services. It is not intended that the Guidelines be used as a legal document or to alter contracts between *Members* and *Clients*.

A deviation that detracts from the overall purpose of the Guidelines should be avoided. The Guidelines are intended to establish minimum standards of practice which must be met to fulfil the *Member's* professional obligations, especially in regard to the primary duty to protect the public. The Council of PEGNL intends that failure to meet these standards may give rise to disciplinary proceedings.

PEGNL advocates that *Members* receive fees for services in accordance with PEGNL's fee schedules. These Guidelines should be used as a basis for the service to be provided when establishing a contractual agreement with a *Client*.

1.2 SCOPE OF GUIDELINES

These Guidelines apply to the practice of Municipal Engineering and outline the professional services which should be provided. They specify the tasks which should be performed to protect the interest of the *Client* and the public. Coordination with work of the other design, fabrication and construction team participants is also outlined. Adherence to these Guidelines will enhance the quality of the overall project services.

1.3 QUALIFICATION

Notwithstanding the purpose and the scope of the Guidelines, deviation from the Guidelines does not imply negligence or unprofessional conduct in the performance of the *Engineer's* professional services.

2.0 DEFINITIONS

Association:

Professional Engineers and Geoscientists Newfoundland & Labrador (PEGNL).

Authority Having Jurisdiction:

The governmental body with authority to administer and enforce the applicable codes or the local by-laws.

Basic Services:

The services provided by the *Engineer* as set out in Section 4.3.

Client:

The party who engages the *Engineer* to provide professional engineering services.

Contract Documents:

All documents including the drawings and specifications as defined in the construction contract(s) for the *Project*.

Contractor:

The person or body corporate who has a contract for the construction of all or a portion of the *Project*.

Engineer

The person or body corporate designated as the *Engineer* in an agreement for professional engineering services.

Fabricator:

The *Subcontractor* responsible for the supply and/or fabrication of components to satisfy a specific contract.

Field Services:

The services provided by the *Engineer* as set out in Section 4.3.5 to ascertain if the construction work is generally in accordance with the *Contract Documents*.

Maintenance Manual:

A binder containing all the necessary technical information on systems for the *Client* to carry out maintenance and operation of the equipment installed under the contract.

Member:

A *Member* in good standing with PEGNL.

Project:

The total construction of which the *Work* performed under the *Contract Documents* may be the whole or a part.

Subcontractor:

The person, company or other entity who contracts with the *Contractor* to perform a specified part of the *Contractor's* work.

Submittal(s):

Items required by the *Contract Documents* to be submitted such as requests for payment, progress reports, shop drawings, manufacturer's literature on equipment, schedules, etc. *Submittals* are normally used by the *Engineer* to aid in determining if the *Work* and *Work* products conform with the intent of the *Contract Documents*.

Supplementary Services:

Services, as set out in Section 4.4, which the *Engineer* may provide in addition to the *Basic Services*.

Work

Includes the whole of the works, materials, matters and things required to be done, finished and performed by the *Contractor* under the contracts.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

3.1 ENGINEER'S DUTIES AND RESPONSIBILITIES TO THE CLIENT

The *Engineer* Shall:

- 3.1.1 Render services to the *Client* with that degree of care, skill and diligence normally provided in the performance of services in respect of projects of a similar nature to that contemplated by these guidelines at the same time and place that such services are rendered. The services as herein described do not include direction of persons or selection or direction of methods and equipment employed by the *Contractor* in any phase of the *Project*;
- 3.1.2 When needed and with the prior approval of the *Client*, engage Sub-Consultants to perform services necessary to enable the *Engineer* to carry out his/her duties and responsibilities. Prior approval of the *Client* is required unless an emergency or contract delay situation arises;
- 3.1.3 Act as the *Client's* agent as required in connection with the *Project*;
- 3.1.4 Provide for the consideration of the *Client* all sketches, drawings, specifications, tenders, proposals, contracts, and other documents relating to the various stages of the *Project*;
- 3.1.5 Inform the *Client* of any requirements for entry and ready access to property (public and private) as well as to the *Project* site, giving sufficient notice for the *Client* to meet these requirements without causing undue *Project* delay;
- 3.1.6 Designate in writing an individual to act as his/her representative, such person to have complete and exclusive authority to transmit information to and receive instructions from the *Client*;
- 3.1.7 Notify the *Contractor* immediately if he/she does not perform the *Work* in conformance with the *Contract Documents* and undertake all reasonable actions to have the *Work* rectified;
- 3.1.8 Keep the *Client* informed as necessary on all aspects of the *Project*;
- 3.1.9 Provide a schedule indicating dates of submission or completion for predesign, design, tender call and construction, an estimate of construction cost, and an estimate for the various types of consulting services for the completion of the work;

- 3.1.10 Monitor the *Project* to ensure that it stays within the approved budget. Notify the *Client* immediately of any projected cost overruns to enable him to make the necessary financial decisions. Prepare documentation of and receive approval for any change orders to the contract. Prior approval of the *Client* in writing is required for any increase in costs;
- 3.1.11 Ensure that field personnel are familiar with the "Occupational Health and Safety Act" including all amendments and regulations and are provided with a copy to be kept in the field office at all times as a reference;
- 3.1.12 Liaise with the *Authorities Having Jurisdiction* and agencies and design the *Project* to conform to their requirements;
- 3.1.13 When advised of deficiencies in the *Work* during the warranty period, take immediate action to have the deficiencies corrected by the *Contractor*;
- 3.1.14 Assume all the responsibility of a *Contractor* if undertaking the construction of the *Project* or any part thereof.

3.2 CLIENT'S DUTIES AND RESPONSIBILITIES TO THE ENGINEER

The *Client* Shall:

- 3.2.1 Make available to the *Engineer* all relevant information which is required and provide written instructions as to the *Client's* requirements. Unless specifically told otherwise, the *Engineer* shall be entitled to rely upon the accuracy and completeness of such information, furnished by or through the *Client*, including information originating with the *Client's* consultants, whether such consultants are engaged at the request of the *Engineer* or otherwise. Where such information originates either with the *Client* or with the *Client's* consultants then the *Engineer* shall not be responsible for the consequences of any error or omission contained therein;
- 3.2.2 Have the right to engage consultants directly to perform services necessary to enable the *Engineer* to carry out his/her duties and responsibilities. Such services shall include, but not be restricted to, an accurate survey of the work site, site services reports, geotechnical reports, and all appropriate testing services. Otherwise, the *Client* must permit the *Engineer* to engage sub-consultants to perform such services;
- 3.2.3 Authorize the *Engineer* to act as agent for such purposes as are necessary to the *Engineer's* rendering of his service pursuant to these guidelines;
- 3.2.4 Give prompt review and approval to all sketches, drawings, specifications, tenders, proposals, contracts, and other documents provided by the *Engineer* so as not to delay the *Engineer, Contractor* or *Subcontractor*;
- 3.2.5 Compensate the *Engineer* for services and expenses as provided for in PEGNL's fee schedules;
- 3.2.6 Reimburse the *Engineer* for advertising expenses related to obtaining tenders, necessary legal, accounting, and insurance counselling services;
- 3.2.7 Arrange and make provision for the *Engineer's* entry and ready access to property (public and private) as well as to the *Project* site as necessary to enable the *Engineer* to perform his/her services;
- 3.2.8 Designate in writing an individual to act as representative, such person to have complete and exclusive authority to transmit instructions to and receive information from the *Engineer*;

- 3.2.9 Give prompt written notice to the *Engineer* whenever the *Client* or the representative become aware of any defects or deficiencies in the *Work* or in the *Contract Documents*;
- 3.2.10 Ensure that all required approvals, licences and permits from the *Authorities Having Jurisdiction* are obtained prior to proceeding with construction;
- 3.2.11 Upon substantial performance of the *Work*, assume responsibility for the operation, general maintenance, and upkeep of the system. Immediately report to the *Engineer* any noted deficiencies in the *Work* which become evident during the warranty period;
- 3.2.12 If undertaking the construction of the *Project* or any part thereof, assume all the responsibilities of the *Contractor*;
- 3.2.13 If deemed necessary, designate a person to be trained by the *Engineer* in the operation of the system;
- 3.2.14 Not enter into contracts in connection with the *Project* which describes duties and responsibilities of the *Engineer* which are inconsistent with those duties and responsibilities;
- 3.2.15 Authorize in writing any other duties and responsibilities of the *Client* to the *Engineer* as agreed to by both parties.

3.3 CONTRACTOR'S DUTIES AND RESPONSIBILITIES

It is not the mandate of this guideline to stipulate the responsibilities of the *Contractor*, however, the *Contract Documents* should clearly state that:

- 3.3.1 The *Contractor* is responsible for all labour, materials, equipment, and plant required to complete the *Work*;
- 3.3.2 The *Contractor* is responsible for the construction methods, techniques, sequences, procedures, safety precautions and programs associated with the construction work, all as set out in the *Contract Documents*;
- 3.3.3 The *Contractor* is responsible for coordinating the work of the *Sub-Contractors* and for checking the *Sub-Contractors'* work;
- 3.3.4 The *Contractor* is responsible for verifying that the work is complete prior to requesting a field review by the *Engineer*;
- 3.3.5 The *Contractor* is responsible for providing reasonable written notice to the *Engineer* when components are ready for field review;
- 3.3.6 The *Engineer's* field review does not relieve the *Contractor* from his responsibilities to complete the work in conformance with the *Contract Documents*;
- 3.3.7 The *Contractor* and all applicable *Subcontractors* must visit the site prior to tender closing.

3.4 SELECTION OF CONSULTANTS

The recommended procedures for selecting a consultant are as described in the "Selection by Ability" booklet published by PEGNL.

4.0 GUIDELINES FOR PROFESSIONAL PRACTICE

The following are guidelines for services which the *Engineer* should provide as part of good practice. They may assist the *Engineer* in outlining municipal engineering services to a *Client*. These guidelines deal in an advisory way with matters of practice and procedure rather than with matters of substantive engineering.

4.1 SOLE USE OF DOCUMENTS

The following clause should appear on all drawings and specifications:

"These design documents are prepared solely for the use of the party with whom the *Engineer* has entered into a contract. There are no representations of any kind made by the *Engineer* to any other party."

4.2 SCOPE OF SERVICES

Before commencement of design services, the *Engineer* shall meet with the *Client* to:

- 4.2.1 Determine the terms of reference and the scope of work of *Basic Services* and *Supplementary Services*;
- 4.2.2 Reach agreement on fees, payment schedule and professional liability insurance coverage;
- 4.2.3 Reach agreement on a contract.
- 4.2.4 For a "fast-track" project, in addition to the above, the *Engineer* should:
 - (a) Establish with the *Client* the terms and conditions under which preliminary or partially complete *Contract Documents* may be issued in advance and clearly define the requirements for partially complete *Contract Documents*;
 - (b) Advise the *Client* that no part of the documents can be considered complete before all *Contract Documents* are completed.

4.3 BASIC MUNICIPAL ENGINEERING SERVICES

The usual stages of the *Basic Services*, as discussed herewith, are generally organized in an agreement according to the sequential stages of a typical project. Because of the requirements of the specific project, certain *Basic Services* activities may be required to be performed out of the normal sequence or in difference stages than indicated in the scope of services.

4.3.1 PREDESIGN STAGE

In the Predesign Stage, the *Engineer* may:

- 4.3.1.1 Attend, as required, periodic meetings with the *Client* and design team to obtain the *Client's* instructions regarding functional, aesthetic, cost and scheduling requirements to prepare a concept design;
- 4.3.1.2 If required, assist the *Client* in:
 - (a) Defining the need for any specialty consulting services which may be required for the *Project*;
 - (b) Developing or reviewing the *Project* schedule including any milestone dates;
 - (c) Determining channels of communication;
 - (d) Determining drawing standards and specifications format;
 - (e) Determining the number and timing of *Project* meetings during each stage of the *Project*;
- 4.3.1.3 Establish dates by which information affecting the design will be needed from other disciplines;
- 4.3.1.4 Conduct field reviews and review existing drawings where appropriate;
- 4.3.1.5 Establish criteria for other consultants as required. Comment on reports presented;
- 4.3.1.6 Identify design criteria and prepare preliminary calculations;
- 4.3.1.7 Evaluate all feasible alternatives and develop a preferred scheme;
- 4.3.1.8 Check applicable codes, standards, regulations and restrictions, insurance requirements and other factors affecting the design of the *Project* and establish and obtain agreement with the *Client* on the applicable codes and standards to

be followed;

- 4.3.1.9 Prepare a conceptual cost estimate or cooperate appropriately with others responsible for reporting the estimate, if required;
- 4.3.1.10 Establish, where appropriate, comparative information to be used in selection of systems for the *Project*;
- 4.3.1.11 Describe the major system(s) and each significant component and material;
- 4.3.1.12 Inform the *Client* of all new construction materials or new techniques proposed for use in the *Project* and their alternatives, including the risks, advantages and disadvantages over both the short and long term, so that the *Client* can weigh the choices and make an informed decision before the *Engineer* proceeds further;
- 4.3.1.13 If required, prepare a predesign report which defines the systems selected for the project and outlines the reasons involved in the selection.
- 4.3.1.14 A *Client* may assume responsibility for all or some of the foregoing activities provided:
 - (a) the *Engineer's* ability to satisfy the requirements of the subsequent stages of these guidelines is unimpaired;
 - (b) the responsibility for such preliminary design activities is clearly defined in writing;
 - (c) the *Client*, in writing, waives the *Engineer's* responsibility for such preliminary design activities and their effect on the selection of the systems.

4.3.2 DESIGN DEVELOPMENT STAGE

In the Design Development Stage, when the selected scheme is developed in sufficient detail to enable commencement of the final design and construction documents, the *Engineer* may:

- 4.3.2.1 Review results of studies by specialist consultants, such as geotechnical, fire protection, etc.;
- 4.3.2.2 Provide preliminary analysis and design calculations and select appropriate equipment;
- 4.3.2.3 Prepare preliminary design drawings, as required, depending on the complexity of the design, based on information coordinated with other consultants;
- 4.3.2.4 Prepare or edit the "Outline Specifications";
- 4.3.2.5 Submit design development documentation for review and approval by the *Client*;
- 4.3.2.6 Carry out an investigation, analysis and/or studies to determine the user requirements and subsequently the system design criteria for materials and performance;
- 4.3.2.7 Provide analysis of long range plans as defined by the *Client* and attendant preliminary sketches and reports (master planning).

4.3.3 CONTRACT DOCUMENT STAGE

4.3.3.1 General:

- (a) Design the systems;
- (b) Determine and specify in the *Contract Documents* which elements are to be designed by other *Members*;
- (c) Attend periodic coordination meetings, as required;
- (d) Coordinate with the *Authority Having Jurisdiction*, as required;
- (e) Establish testing and inspection requirements;
- (f) Seal documents per Engineers and Geoscientists Act.

4.3.3.2 Calculations

The *Engineer* must prepare calculations to support all designs. The calculations should be prepared legibly and presentably and filed by the *Engineer* for record purposes. Hard copy of input and output of any computer analysis should be included as well as description of the software used.

In general, calculations include but are not limited to:

- (a) Design criteria:
 - Discussion and description of design basis including assumptions;
 - Codes or standards used with edition dates;
 - List of design parameters and provisions greater than code and standard requirements as requested by the *Client* or otherwise used by the *Engineer*;
- (b) Location diagrams for specialty elements;
- (c) Computer analysis and design results, if applicable;
- (d) Special studies and analysis where required by Code;
- (e) For critical design elements and where required by Code, work done by an *Engineer* with limited experience shall be checked by an independent qualified *Engineer*, not necessarily from a separate company;
- (f) The names of the design engineer(s) and design check engineer;
- (g) Table of contents for or index to the calculations.

4.3.3.3 Contract Drawings

A general plan should show a summary of all proposed facilities and services at an appropriate scale. For large projects, a location plan at a convenient scale should be provided showing the geographic location of the project.

Engineers should endeavour to standardize plan sizes and scales in the best interests of their *Clients*. The drawings for municipal projects will be of two basic types: a) those relating to work within road and right of way allowances, either for roads or for services therein, and b) those relating to treatment plants, pumping stations, bridges and other structures:

(a) Works within Road and Right of Way Allowances

These drawings should generally show plan and profile, augmented with cross sections and detailed drawings as required.

Plans and profiles should normally be drawn to a horizontal 1:500 scale and a vertical scale of 1:100, subject to the requirements of the municipality. The north point should be shown on each plan, together with the names of the streets, lot numbers, property lines and frontage dimensions obtained from existing municipal plans.

Design details of standard units of construction, such as road sections, maintenance holes, catch-basins, valve chambers, hydrants, street light standards, guiderails and pipe bedding, should be presented on standard drawings at appropriate scales. Plans should show the location of all known existing utilities both underground and on the surface, all existing topographic features including embankments, buildings, mature trees, entrances, signs, fences, etc., within the road allowance or in proximity to the work.

Profiles shall show the existing surface profile, the approximate location and elevation of known existing utilities which will be intersected by the new work and any available soils information.

For roadwork, the profile should indicate the finished road surface giving the length and grade of each tangent section of vertical curve.

For sewers and watermains, the profile should show an invert and obvert profile of the pipe. For sewers, invert and basement elevations should be shown and for watermains, minimum depths of cover, as required. The length, grade and class of pipe and type of bedding or encasement for each section should be indicated.

(b) Treatment Plants, Pumping Stations, Bridges and Other Structures

Design of pumping stations and plants shall be such that competitive bidding is encouraged for the supply of equipment and structures unless special conditions require the supply of specific equipment or structures.

These drawings should be grouped according to the type of work to which they relate and, where applicable, should comply with the APEGN Guidelines in the structural, mechanical and electrical fields.

The manner of presentation of the work in the plan form, the rendering of detail in line diagrams, the dimensioning and lettering and all other drafting work should be carried out in a professional and skilled manner to ensure that the work is presented in an orderly fashion, the facilities and structures are shown in a recognizable manner and that the wording on the plans is simple, concise, grammatically correct and completely legible.

4.3.3.4 Specifications

The specifications should be for all works shown on the drawings for which the *Engineer* is responsible. They should be complete, clear and concise, with a statement setting forth the general scope of work followed by an adequate description of the various classes of work, segregated by trade and under proper sections and headings. The quality of materials and standard of work required of the *Contractor* should be described in detail. Each section and heading should be identified for easy reference. Where applicable, standard specifications related to the type of work to be carried out shall be incorporated in the *Contract Documents* by reference and the nomenclature used on the drawings shall be consistent with the specifications.

4.3.3.5 Other *Contract Documents*

As well as plans and specifications, the design function should include the provision of forms of bonds, a form of tender, schedule of quantities, articles of agreement, general conditions of the contract and special conditions that may be required by the *client* or other public agency.

4.3.3.6 Final Cost Estimate

The *Engineer* should provide the *Client* with a cost estimate based on the final design.

4.3.3.7 Approvals

Engineers should become familiar with all *Authorities Having Jurisdiction* over any component of the *Work*. They should submit plans, specifications, schedules, and applications for approval to *Clients* and to appropriate authorities, as required. They should attend meetings at the offices of these public authorities to discuss designs and to provide explanations for the purpose of furthering the applications towards approval.

In addition, the *Engineer* may be required to prepare special applications or reports to assist the municipality in obtaining subsidy payments, grants or special financing from senior levels of government.

4.3.4 TENDERING STAGE

4.3.4.1 Assist in the preparation of pre-qualification documents, if required;

4.3.4.2 Assist in reviewing bidders' qualifications, if required;

4.3.4.3 Provide assistance to the *Client* in answering queries raised by the bidding contractors and issue addenda and clarification of documents, as required;

4.3.4.4 Assist in analysis and evaluation of tenders submitted, as required;

4.3.4.5 Assist in the preparation of the contract, if required.

4.3.5 CONSTRUCTION STAGE

The services to be provided by the *Engineer* during construction of a *Project* fall into two (2) categories, namely, General Review Services and Resident Staff Services During Construction.

These services are provided by the *Engineer* to determine that materials used and results achieved by the *Contractor* are in general conformity with the *Contract Documents*. *Contractors* are responsible for discharging their obligations under the terms and conditions of the construction contract. The *Engineer*, on behalf of the *Client*, should carry out a review of the *Work* during its execution.

The performance of the contract is not the *Engineer's* responsibility nor are

review services rendered for the *Contractor's* benefit.

When, in the opinion of the *Engineer*, a resident engineer and staff are required, the *Engineer* should so advise the *Client*. This service may be provided by an authorized representative of the *Engineer*, or by a sub-consultant reporting to the *Engineer*.

4.3.5.1 General Review Services

The extent of the *Engineer's* duties for general review during construction should be clearly defined in the *Engineer's* agreement with the *Client*.

It is to be understood that only work which has actually been seen during examination of representative samples can be said to have been appraised, and comments on the balance of the work are assumptions based upon extrapolation.

The General Review Services to be provided by the *Engineer* are as follows:

- (a) advise the contractor on the interpretation of the *Contract Documents* and issue supplementary details and instructions during the construction period as required;
- (b) review for approval the construction schedule proposed by the *contractor*;
- (c) review submitted shop drawings for general compliance with the design requirements;
- (d) consider and advise on alternative equipment and materials proposed by the *Contractor*;
- (e) advise on the issue of change orders and on the validity of charges for additions or deletions;
- (f) process *Contractor's* progress and final requests for payment and issue certificates for the *Client's* acceptance;
- (g) maintain adequate records related to the *Contract*;

- (h) in accordance with the *Engineer/Client* agreement, make periodic visits to the site during construction to ascertain that the *Work* is being executed in reasonable conformity with plans and specifications;
- (i) arrange for the testing and inspection of materials and work by an authorized inspection and testing company as stipulated in the *Engineer/Client* agreement, as well as any unforeseen testing deemed necessary;
- (j) attend all job meetings, if required;
- (k) report progress and any difficulties encountered.

4.3.5.2 Resident Staff Services During Construction

Resident staff services will be provided by the *Engineer* on a full-time basis. This service may be provided by an authorized representative of the *Engineer*, or by a sub-consultant reporting to the *Engineer*. Such services should include the following:

- (a) provide reference line and elevation to the *Contractor* at the beginning of the *Contract* and, where necessary, check the *Contractor's* line and grade;
- (b) determine if the *Contractor* is carrying out the *Work* in accordance with the *Contract Documents* and communicate with the *Contractor*, the *Engineer's* authorized representatives, and the *Client* regarding deficiencies in the *Work*, and other matters of direct interest or concern;
- (c) arrange for or carry out all necessary field testing and inspection of materials and equipment installed;
- (d) On unit price based contracts, measure and record all work and material quantities in a form consistent with schedule of quantities for the *Work*;
- (e) investigate, report and advise on unusual circumstances which may arise during construction;
- (f) carry out final inspection at the conclusion of the construction contract, as part of the acceptance program of the *Client*;
- (g) obtain and record field information of construction details for the modification of contract drawings;
- (h) maintain sufficient data to determine periodic progress of the *Work*, and;

- (i) prepare recommendations to the *Client* regarding payments to the *Contractor*, taking into account progress of work, materials and equipment delivered to site, and contractual and statutory holdbacks.

4.4 SUPPLEMENTARY MUNICIPAL ENGINEERING SERVICES

In addition to the *Basic Services*, the *Engineer* may provide the following *Supplementary Services* if the *Engineer* and the *Client* reach appropriate mutual agreement. They are generally not considered intrinsic parts of the basic municipal design services, as set out in Section 4.3, and are not part of the minimum services which the *Engineer* should provide under these Guidelines.

Examples of *Supplementary Services* are:

- 4.4.1 Design work resulting from changes to the *Project* as originally described and agreed to under the Agreement between the *Engineer* and *Client* such as changes in scope, complexity, diversity or magnitude of the *Project*;
- 4.4.2 Preparation of alternate designs and related documentation, as requested by the *Client*, after selection of the systems made during the predesign stage;
- 4.4.3 Review, design and documentation of alternate systems, if requested by the *Client* or the *Contractor*, for tendering to obtain competitive bids for items such as proprietary products;
- 4.4.4 Work connected with the preparation of documents for tendering segregated contracts, pre-tendered contracts, phased or fast-track construction;
- 4.4.5 Review of alternate designs or products after completion of the *Contract Documents*;
- 4.4.6 Work resulting from changes necessary because of construction cost over-run which is outside the control of the *Engineer*;
- 4.4.7 Translation of *Contract Documents* into a second language, conversion to other units, special preparation of drawings for reduction;
- 4.4.8 Travelling time outside of normal requirements;
- 4.4.9 Construction management or project management services;
- 4.4.10 Value engineering (life cycle costing) analysis including schematics where required by the *Client*;
- 4.4.11 Preparation of designs and documentation for future implementation not included in construction contract;
- 4.4.12 Preparation of additional Bills of Material or Schedules of Material at any time during the *Project*;

- 4.4.13 Certification inspections and testing of life safety systems where required by the *Authority Having Jurisdiction*;
- 4.4.14 Testing of systems requiring confirmation of conformance with specifications;
- 4.4.15 Preparation of *Maintenance Manuals*;
- 4.4.16 Complete or partial revision of design documents previously approved by the *Client* or in keeping with written instructions or drawings previously received from the *Client*;
- 4.4.17 Commissioning of systems including training of personnel and providing operating and maintenance assistance as per the Municipal Water, Sewer and Roads Specifications, Government of Newfoundland and Labrador;
- 4.4.18 Advisory services which include: consultation and advice; appraisals; valuations; research; other services leading to specialized conclusions and recommendations;
- 4.4.19 Fast-track construction. To facilitate an earlier-than-normal construction start, the *Client* may request the *Engineer* to prepare several separate bid packages instead of the normal one. In this case, complete tender documentation necessitating extra work on the part of the *Engineer* is required for each bid package;
- 4.4.20 Review of design drawings or specifications prepared by others;
- 4.4.21 Filing application for and obtaining permits, that are normally the responsibility of others;
- 4.4.22 Preparation of As-Built Drawings as per the Municipal Water, Sewer and Roads Specifications, Government of Newfoundland and Labrador;
- 4.4.23 Design or review of the effects of the *Contractor's* methods, procedures or construction equipment;
- 4.4.24 Work resulting from corrections or revisions required because of errors or omissions in construction by the *Contractor*;
- 4.4.25 Work due to extended time schedules for design or construction beyond the control of the *Client* or *Engineer*;
- 4.4.26 Services as an expert witness in connection with any public hearing, arbitration or court proceedings concerning the *Project*, including attendant preparation of

same;

4.4.27 Work resulting from damage as the result of fire, man-made disasters, or natural disasters;

4.4.28 Authorized overtime work requiring premium pay.

4.5 FABRICATION DRAWINGS AND DOCUMENTS

The *Fabricator* or manufacturer shall produce all necessary drawings and documents to represent the work covered by his contract with the *Contractor*. These drawings and documents are prepared following a review of the *Contract Documents* supplied by the *Engineer* and following the resolution of any errors or requested changes. They usually include:

4.5.1 Shop Drawings

These are drawings produced by the *Fabricator* to provide all information necessary for shop personnel to fabricate and assemble the items. The drawings shall be sealed, signed and dated when incorporating design by other *Members*.