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PROFESSIONAL ENGINEERS & GEOSCIENTISTS NEWFOUNDLAND & LABRADOR
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Guideline for Preparation of Engineering and Geoscience Drawings and Technical Specifications

Professional Engineers & Geoscientists

Newfoundland and Labrador

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Drawings and Technical Specifications

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Drawings and Technical Specifications

1. Introduction

1.1 PEGNL

Professional Engineers and Geoscientists Newfoundland & Labrador (PEGNL) is an organization whose mandate is to regulate the practice of engineering and geoscience in the public interest. PEGNL exists so that there will be competent and ethical practice of engineering and geoscience in Newfoundland and Labrador, and to ensure public confidence in the professions. To practice Engineering or Geoscience in Newfoundland and Labrador you are required to be registered, and in good standing, with PEGNL.

The Newfoundland and Labrador *Engineers and Geoscientists Act, 2008* and the associated *Engineers and Geoscientists Regulations, 2011* under that Act govern the practice of engineering and geoscience in the Province. PEGNL is the authority that licenses practitioners under the Act and administers all aspects of that legislation and strives to ensure the ethical conduct of all professional members

The purpose of PEGNL's Practice Guidelines is to inform and educate its professional members, and the public in matters of professional practice. In general, PEGNL produces these documents to:

- ensure PEGNL professional members, understand their duties in performing specific components of their professional roles in accordance with the current *Act, Regulations and By-Laws*; and
- help the public understand the role of PEGNL professional members and the responsibilities professional members have when performing professional services.

Professional members adhering to this Guideline will ensure themselves and the public that they are following best practices in conforming to the legislation and ethical practices applicable to this guideline.

This Guideline seeks to advise what is normally expected of a reasonable and prudent Professional Engineer or Geoscientist. However, it is not a comprehensive list of what constitutes substantive engineering or geoscience practice. This is an area of responsibility which will remain fully that of the Professional Engineers and Professional Geoscientists.

The intention is not to supersede or replace contractual arrangements designed to satisfy specific situations where good engineering or geoscientific practice might, in certain circumstances, dictate departure from this Guideline.

In addition to items covered in this Guideline each project will have its own discipline-specific requirements for design, safety and quality standards which the professional must respect. This Guideline is intended to be read in conjunction with other applicable PEGNL's Guidelines.

Drawings and Technical Specifications

Questions or concerns relating to this document should be addressed to the Professional Standards Director at PEGNL.

1.2 Drawing and Technical Specification Guideline Purpose

High quality Engineering and Geoscience deliverables are vital to the success of any project. Errors and omissions in engineering or geoscience deliverables can cause significant rework in design, implementation, and/or construction which can affect project cost, schedule, performance, and safety. Key elements of project deliverables are drawings and technical specifications. The purpose of this Guideline is to advise on the proper production of these deliverables.

Engineering and Geoscience drawings and technical specifications require sufficient detail to convey design intent and to permit review. The review process;

- clarifies the required codes and standards and confirms that they are met or exceeded;
- facilitates accurate tendering of work;
- facilitates comprehensive implementation of the work, minimizing errors and omissions.;
- provides an accurate project record; and,
- helps in the operation, training and use of the end product.

The goal of this Guideline is to outline the overall framework which Engineers and Geoscientists should follow in the development, review, and authentication of drawings and technical specifications.

1.3 Definitions

Act

The Newfoundland and Labrador *Engineers and Geoscientists Act, 2008*

As-built

A document reflecting the actual installed, fabricated, constructed or commissioned condition of an item or project based on information provided by another party or by the professional member using information furnished by a third party and not necessarily verified by a professional member. As-builts reflect all field changes and modifications made to the original design during the construction process. Some of the information provided on as-built drawings might be changes authorized by the professional member during construction. Other information might reflect changes initiated by other parties due to site conditions or other causes.

Discipline

A specific field of practice within the professions governed by the Act (e.g., civil engineering, electrical engineering, geology, environmental geoscience, etc.).

Drawings

A graphical representation based on engineering or geoscience conditions or decisions including, but not limited to, process flow diagrams, structural framing plans, electrical power distribution diagrams, site layouts, roadway alignments, municipal infrastructure systems or product manufacture.

Drawings and Technical Specifications

Engineer of Record

The Engineer of Record (EOR) is the discipline-specific professional member responsible for the integrity of the design of the discipline-specific systems shown on all documents prepared by the EOR.

Geoscientist of Record

The Geoscientist of Record (GOR) is the discipline-specific professional member responsible for the integrity of the work on the discipline-specific systems shown on all documents prepared by the GOR.

Member in Responsible Charge (MIRC)

An employee of an organization who is a practicing licensed professional of PEGNL and who undertakes to provide responsible direction and personal oversight in a specific discipline of professional practice in which the licensee is personally competent. The MIRC is specifically named on the Permit to Practice as taking responsibility for a specific discipline of practice.

PEGNL

Professional Engineers and Geoscientists Newfoundland and Labrador

Permit Holder

A corporation or association of persons that holds a permit to practice under the *Act*. A permit holder has a *permit number* issued by PEGNL allowing the permit holder to offer and provide engineering or geoscience services to the public.

Person

An individual, as well as a corporation, company, association, firm, partnership, society or other organization.

Professional Document

A document in any medium (e.g., paper, electronic or other) that contains or presents engineering or geoscience work as defined under the *Act*.

Professional Member

A professional engineer, professional geoscientist, limited licensee (engineering), or limited licensee (geoscience) entitled to engage in the practice of engineering or geoscience under the *Act*.

Record drawing

A professional document prepared by a reviewing professional member after verifying in detail the actual conditions of the completed project to record initial design and/or design changes for which that professional member accepts responsibility and which represents the final design of the task or project for a specified purpose.

Regulations

The Engineers and Geoscientists Regulations, 2011

Technical Specifications

Detailed written descriptions of construction, workmanship, materials and performance. Specifications highlight necessary information which cannot be readily obtained from a drawing.

Issued for Review (IFR)

“Issued for Review” should be clearly noted on any drawing, specification, or other deliverable which is intended to be used solely for review and comment by the client, authorities having jurisdiction or others.

Issued for Tender (IFT)

“Issued for Tender” should be clearly noted on any drawing, specification, or other deliverable which is intended to be used solely for bid solicitation and tendering purposes.

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Issued for Construction (IFC)

“Issued for Construction” should be clearly noted on any drawing, specification, or other deliverable which has passed its final stages of development and review and is ready to be used to instruct the builder or contractor for construction purposes.

Issued for Purchase (IFP)

“Issued for Purchase” should be clearly noted on any drawing, specification, or other deliverable which has passed its final stages of development and review and is ready to be used to instruct the bidder for material and/or equipment purchase.

1.4 Responsibilities of Professional Members and Permit Holders

Professional members and permit holders are responsible for practicing in accordance with the *Act, Regulations and By-laws* (which include the PEGNL Code of Ethics).

A permit holder is corporately responsible for the integrity of its work. A permit holder is responsible to put in place a system enabling engineering and/or geoscience practice to be carried out competently and ethically by the professionals with training and experience in specific disciplines of practice, which includes facilitating compliance with this guideline.

2. Drawings and Technical Specifications Requirements

2.1 Professional Responsibility

- Review and acceptance by the client and / or Authorities Having Jurisdiction (AHJ) does not diminish the responsibility of the Engineer of Record (EOR) or the Geoscientist of Record (GOR). Liability for design work remains with the EOR/GOR and Permit Holder who must confirm that all aspects of design deliverables meet currently-accepted best practices and regulatory codes and standards.
- The EOR/GOR must obtain all necessary background and design information needed for a safe, economical, and reliable design and clearly notify the client of any concerns before contract documents are finalized.
- The design should be presented in clear, complete contract drawings. If another party such as a contractor is responsible for any aspect of the design or materials related to the design, it must be clearly identified that they must engage an appropriate Professional member to design these components of the project. Professional members shall not rely on unlicensed individuals for design.
- The EOR/GOR must oversee and / or prepare technical specifications for all work for which they are responsible. Technical specifications should use standard terms for materials and processes that are consistent with the drawings.
- Appropriately qualified professional members shall carry-out and/or oversee the design for the various disciplines of work involved.
- The EOR/GOR shall review background information and the design methodology; and check and authenticate all drawings and specifications before they are issued to a third party.
- Site supervision, no matter how extensive, does not obviate the requirement for the proper preparation, submission, and revision of drawings and technical specifications.

Drawings and Technical Specifications

- Revisions to or deviations from the design during construction and/or implementation stages of a project must be verified by the EOR/GOR for compliance with the design intent. As-built conditions should be documented on as-built drawings by on-site personnel and confirmed by the EOR/GOR.

2.2 Quality

- The EOR/GOR must ensure that drawings and technical specifications are unambiguously detailed, and sufficiently guide the interpretation and construction of the design. The EOR/GOR should implement a Quality Management system to ensure defects, errors or omissions are captured and appropriately addressed.
- As the purpose of drawings is to represent the design clearly and unequivocally, it is important that they be prepared at an appropriate scale. Where the selected scale or the complexity of the design makes drawings difficult to read and interpret, separate detail drawings should be provided.
- Drawings and specifications shall be neat, legible, and grammatically correct.
- Drawings and specifications should be reviewed by another professional and all involved disciplines prior to issuing. The intent of a secondary review and interdisciplinary check is to provide confidence that the required level of quality is achieved, commensurate with the various project requirements.

2.3 Content

- Drawings and technical specifications should disclose assumptions, missing data, and sources of information which are relevant to the design and which may have implications on project delivery and performance.
- Drawings and technical specifications must clearly indicate all project requirements including (where applicable), but not limited to, materials, tolerances, installation / placement, sequencing, testing, fabrication, temporary works, QA/QC, reporting and inspection.
- All design drawings should clearly indicate the purpose of the drawing which can include “Preliminary”, “Concept Design”, “Issued for Review”, “Issued for Tender”, “Issued for Information”, “Issued for Construction” or “Issued for Purchase”. They should include qualifying notation or limitation regarding scope of the drawings which can include “Not for Construction”, “For Pricing Only” or “For Information Only”.

Note: Authentication of all drawings and specifications must follow PEGNL’s “Guideline for Authenticating Professional Documents”.

- Drawings should be unambiguous and clear, conform to standards, complete and suitable for duplication. They should include all information necessary to demonstrate conformance with regulations and applicable codes.
- Drawings should incorporate schematics and diagrams for all major systems. They should likewise provide layouts for all systems where necessary for clarity, with large-scale details, elevations and sections properly cross-referenced.
- Drawings should include symbol lists, legends, and details for all equipment, materials, accessories and systems. They should also include schedules where necessary to define special features of construction or finishes.

Drawings and Technical Specifications

- Reference shall be made to all applicable codes and standards, either on the drawing or in the written specifications (e.g. NBC, CEC, NFC, CSA, etc.)
- All drawings and technical specifications shall be dated, and revisions shall be carefully noted, dated, and recorded in a revision log/history.
- All drawings for buildings or structures are to meet the requirements identified in the National Building Code of Canada latest edition.

2.4 Design Criteria

- All design drawings must be based on appropriate design analysis and calculations. All design analyses and calculations are to be well documented and retained by the EOR/GOR for the life of the project, as required by the professional's insurer or by another authority, whichever is greater.
- Professional members designing projects requiring regulatory review must ensure that the appropriate requirements of the Authority Having Jurisdiction are addressed in the drawings and specifications.