City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Professional Practice Management Plan

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Version: 06

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VER	Date	Revision Summary	Author	Review	Check
06	2026-02-05	PPMP annual review; See 'Revision Notes' for details	NAHADA HARRIS	NAHADA HARRIS	DARYLE TILROE
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Applicability

This *Standard Operating Procedure* (*SOP*) is the *City of Edmonton's* (*City's*) *Professional Practice Management Plan* (*PPMP*), as required by the *Association of Professional Engineers and Geoscientists of Alberta* (*APEGA*). The *PPMP* applies to all *Professional Engineering and Geoscience* (*PEG*) work carried out at the *City*.

Synopsis

Section 48(1) of the *General Regulation* requires all *APEGA Permit Holders* to develop and maintain a *PPMP* that is appropriate to its professional practice. This *PPMP* cross-references existing *City* documents and *PEG Quality Management System (QMS) documents* with *APEGA*'s requirements as defined in "APEGA Professional Practice Management Plan."

The documents and procedures mentioned in this *PPMP* are intended to prioritize the public interest and ensure it remains of utmost importance in the *City's PEG* activities. This commitment to holding the public interest paramount is also in alignment with the APEGA Code of Ethics.

Permit Information

City of Edmonton *APEGA Permit to Practice* is P5038.

Please direct any communication regarding this *PPMP* or the practices of engineering and geoscience to pegbsa@edmonton.ca.

Revision Notes

Version 06 revision contains minor link updates, reference standards, policy and procedure documents where needed for updated documents and refined language for clarity. Major updates include:

- Email 'apegabsa@edmonton.ca' updated to 'pegbsa@edmonton.ca' throughout the document.
- Section 1.1: 'Annual' code of ethics QMS training requirement for APEGA and ASET (P.Tech) members is removed as this is included in APEGA's revised CPD standard annual learning modules requirement. This requirement is also removed from LPs and M.I.T.s roles and responsibilities.
- Section 3: Updated referenced document titles, links, and also removed referenced links and documents where needed for withdrawn documents and webpages.
- Section 4: Modified definition for Continuing Professional Development (CPD).
- Section 6.3: Internal Directory required fields updated to reflect changes in the database.
- Section 7.3 & 7.8: Updated to reflect the requirements of the revised CPD practice standard.
- Section 7.6: Added reference to Standard Operating Procedure (SOP) COE-PEG-SOP-0002
- Section 7.10: Updated to remove reference to withdrawn policy document and to address requirements of the revised CPD practice standard.
- Section 8.3 and 15: Removed reference to withdrawn documents and inactive links.
- Section 9.3: Freedom of Information and Protection of Privacy Act (FOIP) was replaced by the Access to Information Act (ATIA) and the Protection of Privacy Act (POPA); Updated section to reflect this change.

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1. Purpose

The purpose of the *Professional Practice Management Plan* (*PPMP*) as stated in "APEGA Professional Practice Standard for Professional Practice Management Plan" is to document "...corporate policies, procedures, and systems used to ensure organizations and *Licensed Professionals* (*LPs*) *practising* engineering, geoscience, or both maintain appropriate standards of professional practice" and to help "*Permit Holders* effectively plan, execute, and manage the *Quality Control* (*QC*) and *Quality Assurance* (*QA*) of their *Professional Engineering and Geoscience* (*PEG*) practice." The *City of Edmonton* (*City*) is committed to ensuring that the *PEG* work conducted by or for the *City* complies with all regulatory requirements and maintains the highest standards of professional quality. This is ensured through issuing and enacting the "City Standard - Professional Engineering and Geoscience Quality Management System" and meeting the quality objectives defined therein. Together, the "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System" and this *PPMP* form the cornerstone of the *City's Quality Management System* (*QMS*). All other *Standard Operating Procedures* (*SOPs*) applicable to the overall practice are positioned under these two primary documents, collectively constituting the comprehensive *QMS* for *PEG* work.

1.1. Statement on Ethics

The *City* recognizes that professional ethics are founded upon integrity, competence, dignity, and devotion to service. This concept guides our conduct at all times. The *City* believes that ethical practice is reciprocated and leads to successful and rewarding business. The *City* conducts its business and professional practice in a manner that upholds the fundamental principles of ethical conduct, while holding public safety paramount.

The *City* strives to uphold the professional nature of engineering and geoscience and meet the requirements presented in the *General Regulation*, the APEGA Code of Ethics, the "APEGA Guideline Ethical Practice," "City Standard - Code of Conduct," and the "City Administrative Policy A1127 - Respectful Workplace."

New *City* employees must take corporate Code of Conduct training, adhere to the Code, and report any potential violations to their reporting supervisor. All *City* employees are required to complete Respectful Workplace training in conjunction with Code of Conduct training. As directed by Employee Services, long-term employees take periodic refresher training in Code of Conduct and Respectful Workplace.

If attempts by the *City* and its *LPs* to resolve external parties' regulatory non-compliance issues are unsuccessful, the *City* and its *LPs* must notify *APEGA*. The notification must identify any entity or individual failing to meet obligations under the *Engineering and Geoscience Professions Act* (*EGP Act*), the *General Regulation*, or any *APEGA* practice standard.

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LPs have ethical obligations to report actions that put the public interest at risk, especially if there is a risk to an identifiable individual or group of individuals, to the environment, of serious bodily harm or death, or of imminent danger as described in "APEGA Guideline Ethical Practice." In addition, suspected fraud must also be reported by anyone to *City* officials as outlined in "City Administrative Policy A1464A Fraud, & Procedures - Fraud Reporting and Investigation and Whistleblower Protection." This policy includes whistleblower protection, ensuring those who report are protected from retaliation.

1.2. Commitment to Professionalism

The *City* is committed to maintaining a workplace where:

- engineering and geoscience work is carried out by qualified professionals who are supported by appropriate resources
- adequate supervision and controls are maintained to ensure that the *practice of engineering and geoscience* is conducted competently and with *due diligence*
- all *LPs* and *Members-in-Training* (*M.I.T.s*) are accountable for *practising* in an ethical and professional manner, ensuring compliance with the *City's* policies and procedures

1.3. Commitment to Safety

The *City* is committed to maintaining a safe workplace aligned with its "City Administrative Policy A1117D Occupational Health and Safety and Procedure" where:

- a healthy, safe, and productive work environment is promoted by all
- a physically, psychologically, and socially safe workplace exists, free from harassment
- issues with the above are reported to leadership

1.4. PPMP Administration

The *City* recognizes that an effective and efficient *PPMP* is essential to manage the professional *practice of engineering and geoscience*. The *PPMP* must be reviewed annually by the *Practice Office* to verify its continued suitability and effectiveness, and must be updated as soon as practicable when substantive changes are implemented to the *scope of practice* or organizational structure.

PPMP annual reviews are conducted to clarify organizational structure and roles, examine areas of concern, ensure references are current and accessible, and confirm *QC* and *QA* processes are adequate. Comments related to the *PPMP* and practice in general are collected, retained, addressed, and communicated. The *PPMP* must be signed and dated annually by the *Senior Officer* (*SO*) and at least one *Responsible Member* (*RM*). If no updates are required, the *PPMP* must be reaffirmed annually.

Changes to the *PPMP* are communicated to all *LPs* and *M.I.T.s* via e-mail, and all individuals who use their professional designation at the *City* are required to attest they

have read and understood its contents. This attestation is recorded in the *City*'s internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory."

2. Scope

2.1. In Scope

The *City's scope of practice* covered under its *APEGA Permit to Practice* includes both engineering and geoscience practice and the management of engineering and geoscience projects related to the policy, planning, design, construction, operations, maintenance, decommissioning, and closure of the physical or digital infrastructure assets within the *City*. Engineering and geoscience *disciplines* practised at the *City* include: civil and structural, computer hardware and software, chemical, electrical and electronics, environmental, fire protection, geotechnical, geoscience, geomatics, mechanical, surveying, and transportation.

In addition, the *scope of practice* includes *LPs* of the Office of the City Auditor who evaluate processes and outcomes of work performed by *LPs* in the *City* Administration. The City Auditor reports directly to the *City Council* through the Audit Committee and is not part of the *City* Administration. The *City's Permit to Practice* also applies to the engineering and geosciences professionals with the Edmonton Police Service.

While acknowledging and respecting the work of other professions in the *City*, this *PPMP* applies only to the professional *practice of engineering and geoscience*.

2.2. Out of Scope

The *City* is an Authority Having Jurisdiction (AHJ) under "The Safety Codes Act," with its responsibilities clearly defined in that legislation. It is important to note that the *City's* role as AHJ is entirely separate and distinct from its role as a *Permit Holder* with *APEGA.* Specifically, when acting as AHJ, the *City* does not partake in the practices of engineering or geoscience. In this capacity, artifacts submitted to the *City* for permitting or inspection are the responsibility of other professionals, as outlined in the legislation. The *City* does not conduct reviews or evaluations of the submitted artifacts from an engineering perspective, and does not bear professional responsibility for their contents.

The *City's Permit to Practice* does not apply to engineering and geoscience practices within the EPCOR Utilities Inc., the *City's* wholly-owned electrical, water, and drainage utility, who operates under a separate *APEGA Permit to Practice*. The *City's Permit* does not apply to the Edmonton Public Library Board and other *City* boards and commissions that do not report directly to Edmonton's *City Manager*, except where contracted by those organizations to perform work on their behalf.

3. References

The following reference documents are considered part of the *PPMP*. *LP*s and *M.I.T.s* are expected to be knowledgeable about the documents listed below. The requirements outlined

in this *SOP* serve to provide supplementary and further clarification to those stated in the referenced documents. In case of conflict, real or perceived, the most restrictive requirements of either the *APEGA*, provincial, or *City* regulatory documents will generally govern. Any conflict must be promptly reported to any *RM* and the *Practice Office.* The *Professional Practice Leader* (*PPL*) will, at their discretion, notify the *Deputy Officer* (*DO*) and/or the *SO.* Requirements contained in referenced documents might not be repeated herein.

Along with the documents below, many of the more dynamic resources and references are available on the *City's* internal and external webpages:

- PEG Practice Website
- OneCity intranet
- City of Edmonton - APEGA & ASET (P.Tech) Member Directory
- Procurement and Contract Management Webpage
- CPSS Training and Reference Material Webpage
- Project Management Reference Guide (PMRG) Webpage
- HumanConcepts Saba Org Planning Website
- Learning Management System (LMS)
- City Design and Construction Standards Webpage
- City Municipal Bylaws
- City Corporate Policies
- Safety Data Management System (SDMS)
- Enviso - Edmonton's Environmental Management System (Internal Site)

3.1. PEG Quality Management System

- CoE - TriDocs Drive and Index
- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0003 Developing and Issuing Engineering & Geoscience Quality Management System (QMS) Documents
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management

- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering and Geoscience Software
- COE-PEG-SOP-0008 Managing Consequential Changes and Record Documents
- COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements
- COE-PEG-FORM-0002 PEG Outsourcing Form - Standalone Contracts for PEG Services
- COE-PEG-FORM-0003 PEG Outsourcing Form - Standing Arrangement for PEG Services
- COE-PEG-FORM-0004 PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services
- COE-PEG-SOP-0010 PEG Internal Practice Reviews
- COE-PEG-SOP-0011 Non-Conformance Process
- COE-PEG-WI-0009 Onboarding & Offboarding APEGA and ASET (P.Tech) Members

3.2. Provincial Regulation and APEGA

- The Engineering and Geoscience of Professions Act of Alberta
- The Engineering and Geoscience Professions General Regulation
- The Protection of Privacy Act (POPA)
- The Access to Information Act (ATIA)
- The Municipal Government Act of Alberta
- The Safety Codes Act
- APEGA Professional Practice Standard for Continuing Professional Development (CPD)
- APEGA Professional Practice Guideline Personal Annual Competency Evaluation (PACE)
- APEGA Guideline for Contract Employees and Independent Contractors
- APEGA Guideline for Environmental Practice
- APEGA Guideline Ethical Practice

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- APEGA Good Standing Policy
- APEGA Guideline for Selecting Engineering and Geoscience Consultants
- APEGA Professional Practice Standard for Authenticating Professional Work Products
- APEGA Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings
- APEGA Professional Practice Standard for Professional Practice Management Plan
- APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience
- Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta - Joint Practice Standard
- Professional Responsibilities in Completion and Assurance of Wetland Science, Design, and Engineering Work in Alberta- Joint Practice Standard

3.3. City of Edmonton Municipal and Corporate

- City Standard - Professional Engineering and Geoscience (PEG) Quality Management System
- City Standard - Code of Conduct
- City Bylaw 7188 - North Saskatchewan River Valley - Area Redevelopment Plan
- City Bylaw 16620 - City Administration Bylaw
- City Policy C505 - Edmonton's Environmental Management System
- Council Policy C512 - Environmental Policy
- City Policy A1427 Environment Protection, Compliance and Reporting
- Council Policy C587A - Enterprise Risk Management
- Council Policy C571 - Brownfield Remediation and Redevelopment Support
- Council Policy C627A - Climate Resilience
- City Administrative Policy A1127 - Respectful Workplace
- City Administrative Policy A1464A - Fraud & Procedures - Fraud Reporting and Investigation and Whistleblower Protection
- City Administrative Policy A1117D Occupational Health and Safety & Procedure

- City Standard - Project Management for Capital Projects
- City Administrative Policy A1477 - Data and Information Management
- City Administrative Directive A1429D - Acceptable Use of Communication Technology & Procedure
- City Administrative Policy A1473A - Cyber Security
- City Administrative Directive A1433A - Privacy
- City Administrative Directive A1442B - Information Technology Hardware and Software Non-Standard Requests & Procedure
- Procurement Standard - The City of Edmonton
- Terms and Conditions for Management and Exempt Employees
- Edmonton City Plan

4. Definitions

Reference should be made to the *APEGA* standards above and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in the "COE-PEG-SOP-0002 Engineering and Geoscience Quality Management System," or other *QMS* documents, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience a COE-PEG-Defined Terms Dictionary is maintained.

4.1. APEGA

The Association of Professional Engineers and Geoscientists of Alberta (*APEGA*) which regulates the *practices of engineering and geoscience* in Alberta on behalf of the Government of Alberta through the *Engineering and Geosciences Professions Act* and *General Regulation*.

4.2. ASET

The Association of Science & Engineering Technology Professionals of Alberta (*ASET*) designation shows a member has met strict national criteria for certification in their field. Under the *Engineering and Geoscience Professions Act*, *ASET* members are also accountable for public safety under the law.

4.3. Authenticat(ing/e/ed/ion)

A process carried out on a *Professional Work Product* (*PWP*) that signifies *a Licensed Professional* (*LP*) has completed, performed a *thorough review* of, or *directly supervised and controlled* the engineering or geoscience work and accepts professional

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responsibility for it. *Authentication* involves the application of the representation of an *LP*'s professional stamp and personal *wet signature* or digital certificate in accordance with the "APEGA Professional Practice Standard for Authenticating Professional Work Products" and "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products."

4.4. City of Edmonton (City)

The municipal corporation of the *City of Edmonton*.

4.5. City Council

The elected governing body of the *City of Edmonton* as authorized by the "Municipal Government Act of Alberta."

4.6. City Manager

The chief administrative officer of the *City of Edmonton* as per "City Bylaw 16620 - City Administration Bylaw."

4.7. Continuing Professional Development (CPD)

The "APEGA Professional Practice Standard for Continuing Professional Development (CPD)" describes the activities and minimum requirements *Licensed Professionals (LPs)* must meet to fulfill their *Continuing Professional Development (CPD)* obligations and maintain *good standing* status with *APEGA*.

4.8. Deputy Officer (DO)

A person delegated by the *Senior Officer* (*SO*) to assist in meeting their responsibilities. Generally, a senior member of the management team. If a *Deputy Officer (DO)* is not assigned by the *SO*, all responsibilities designated to the *DO* rest with the *SO*.

4.9. Direct Supervision and Control

The high degree of guidance a *Licensed Professional* (*LP*) provides to one or more individuals. The *LP* accepts professional responsibility for *Professional Engineering and Geoscience* (*PEG*) tasks performed under this guidance. *Direct supervision and control* includes directing, monitoring, and controlling the *PEG* work performed, including making all decisions related to *PEG* practice. This includes exercising *due diligence* that demonstrates active involvement and responsible decision making. *LPs* must retain appropriate documentation of *due diligence* and use their professional judgment to determine what documentation will meet the intent of these requirements and reference "COE-PEG-SOP-0004 Engineering and Geoscience Document Management" as required.

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4.10. Due Diligence

The level of judgement, care, forethought, and determination a person reasonably uses to avoid harming oneself, other people, or the environment.

4.11. Engineering and Geoscience Professions Act (EGP Act)

The legislation that governs the *practices of engineering and geoscience* in Alberta: "*The Engineering and Geoscience of Professions Act of Alberta*."

4.12. General Regulation

"*The Engineering and Geoscience Professions General Regulation*."

4.13. Good Standing

The status *Permit Holders, Licensed Professionals,* and *Members-in-Training* have with *APEGA* if they meet the criteria set out in the "APEGA Good Standing Policy."

4.14. Internal Practice Review

A systematic, independent, and documented process to obtain evidence and evaluate if internal processes are in conformance with the *Engineering and Geoscience Professions Act*, *APEGA* practice standards, the "COE-PEG-SOP-0001 Professional Practice Management Plan," and the "COE-PEG-SOP-0002 Engineering and Geoscience Quality Management System," and other related *Quality Management System* documents.

4.15. Licensed Professional (LP)

A professional engineer (P.Eng.), professional geoscientist (P.Geo., P.Geol. (legacy), P.Geoph. (legacy)), *Professional Licensee* (engineering), *Professional Licensee* (geoscience), licensee (engineering), licensee (geoscience), or *Professional Technologist* (*P.Tech*.) entitled by the *Engineering and Geoscience Professions Act* to practise engineering or geoscience in Alberta. There are cases where an *ASET P.Tech.* cannot fulfill all roles and responsibilities that an *APEGA Licensed Professional* (*LP*) can, in particular, they cannot act as an *Responsible Member* under the *City's Permit to Practice*, but unless otherwise noted, they bear all the responsibilities of an *LP* within their limited *scope of practice*. Note, *APEGA's* definition of *Licensed Professional* does not include *P.Techs*.

4.16. Member-in-Training (M.I.T.)

An APEGA membership category granted to an individual who has completed the academic and character requirements but does not meet the experience requirements to become a *Licensed Professional*. E.I.T. (Engineer-in-Training) or G.I.T. (Geoscientist-in-Training) are also used.

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4.17. Outsourc(e/ed/ing)

Procuring *professional services* from an individual or entity not *practising* under the *outsourcing entity's Permit(s) to Practice*. This includes when a sole proprietor procures *professional service*s. Unless otherwise contextualized, this refers to the specific case of the *City* as the *outsourcing entity*. [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience"].

4.18. Outsourced Entity

The *APEGA Licensed Professional, Permit Holder*, or an entity not licensed by *APEGA* that provides *professional services* to an *outsourcing entity.* [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience"].

4.19. Outsourcing Entity

The *APEGA Permit Holder* or *Licensed Professional* that is procuring *professional services*. An *outsourcing entity* procures *professional services* from an *outsourced entity*. [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience"].

4.20. Permit or Permit to Practice

An *APEGA* certificate issued to a partnership, association, corporation, or other entity that grants them the right to practise engineering or geoscience in Alberta pursuant to the *Engineering and Geoscience Professions Act*.

4.21. Permit Holder

A partnership, association, or corporation that holds a *Permit to Practice* as defined in Section 48(1)(d) of the *General Regulation* under the *Engineering and Geoscience Professions Act* (*EGP Act*). Organizations that hold *ASET* permits as defined in Section 86(4) of the *EGP Act* are not included. [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience"].

4.22. Practice of Engineering

As defined in Section 1(q) of the *Engineering and Geoscience Professions Act*:

> Reporting on, advising on, evaluating, designing, preparing plans and specifications for or directing the construction, technical inspection, maintenance or operation of any structure, work or process

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(A) that is aimed at the discovery, development or utilization of matter, materials or energy or in any other way designed for the use and convenience of humans, and

(B) that requires in that reporting, advising, evaluating, designing, preparation or direction the professional application of the principles of mathematics, chemistry, physics or any related applied subject.

Also, but with specified scope, for *Professional Technologists* under Section 86.4(m).

4.23. Practice of Geoscience

As defined in Section 1(r) of the *Engineering and Geoscience Professions Act*:

Reporting, advising, evaluating, interpreting, processing, geoscientific surveying, exploring, classifying reserves or examining related to any activity

(A) that relates to the earth sciences or the environment,

(B) that is aimed at the discovery or development of oil, natural gas, coal, metallic or non-metallic minerals, precious stones, other natural resources or water or that is aimed at the investigation of surface or subsurface conditions of the earth, and

(C) that requires, in that reporting, advising, evaluating, interpreting, processing, geoscientific surveying, exploring, classifying reserves or examining, the professional application of the principles of mathematics, chemistry, physics or biology through the application of the principles of geoscience.

Also, but with specified scope, for *Professional Technologists* under Section 86.4(m).

4.24. Practising or Non-Practising Status

- members holding *practising status* with *APEGA* may practise engineering and geoscience under the *Engineering and Geoscience Professions Act*
- members holding *non-practising status* with *APEGA* cannot independently practise engineering or geoscience and must have their work supervised by a *Licensed Professional* (*LP*) with *practising status*. An *LP* can choose to declare *non-practising status*. Some member types have *non-practising status*, such as Life Members and *Members-in-Training*

4.25. Professional Engineering and Geoscience (PEG)

Refers to the professional *practice of engineering and geoscience.*

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4.26. PEG Job Evaluation Committee (PEGJEC)

As defined in "Terms and Conditions for Management and Exempt Employees - Attachment 4 - Professional Engineer and Geoscientist Pay Administration Guidelines and Job Evaluation," a cross departmental group of experienced *Responsible Members* with considerable knowledge and exposure to *Professional Engineering and Geoscience* (*PEG*) practice and to job evaluation practices. The *PEGJEC* bridges the relationship between *PEG scopes of practice* and job classifications.

4.27. PEG Practice Office (Practice Office)

The group that provides support and oversight to the *practice of engineering and geoscience* within the *City of Edmonton.* The *Practice Office has* overall responsibility for the implementation of, and adherence to, the *Quality Management System* and acts as a liaison between *APEGA* and the *City*.

4.28. Professional Licensee (PL)

An individual permitted to practise engineering or geoscience within a clearly defined *scope of practice* set by *APEGA*. This category acknowledges that individuals with specific qualifications can practise certain professional functions without the supervision from a *Licensed Professional.*

4.29. Professional Practice Management Plan (PPMP)

A *Permit holder's* corporate policies, procedures, and systems describing the *Quality Control* and *Quality Assurance* measures in place to ensure appropriate standards of professional practice are maintained as described in Section 48(1)(d) of the *General Regulation*. Unless otherwise contextualized this means the "COE-PEG-SOP-0001 Professional Practice Management Plan."

4.30. Professional Service

When used in *Quality Management System* documents, services that involve the *practices of engineering or geoscience.* The products generated from *professional services* are called outputs. [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience"].

4.31. Professional Technologist (P.Tech.)

Individuals who are issued a certificate of registration from *ASET* in accordance with the *Engineering and Geoscience Professions Act* to engage in the *practice of engineering or geoscience* within a specified and defined *scope of practice*.

4.32. Professional Work Product (PWP)

An output or artifact of a *professional service* that requires *authentication* and *validation*. Defined in the *General Regulation* as "…plans, specifications, reports, or documents of a professional nature," a *Professional Work Product* (*PWP*) is any output from *Professional Engineering and Geoscience* practice that meets all of the *authentication* test criteria defined in "APEGA Professional Practice Standard for Authenticating Professional Work Products." A *PWP* can be physical (e.g., paper, plastic film), electronic (e.g., electronic document, image), or digital (e.g., software, modelling, simulation, or any other computer application that cannot be reproduced in a physical or electronic format). See the *authentication* test in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" when assessing whether an output is a *PWP*.

4.33. Quality Management System (QMS)

A comprehensive framework and collection of processes designed to consistently meet regulatory and client requirements while enhancing their satisfaction. It is aligned with an organization's (i.e., the *City's*) purpose and strategic direction and encompasses the organizational goals and aspirations, policies, processes, documented information, and resources necessary for effective implementation, ongoing maintenance and *continuous improvement*.

4.34. Responsible Member (RM)

An *APEGA Licensed Professional* who is responsible for the *Quality Control* and *Quality Assurance* and oversight of the *Professional Engineering and Geoscience* practice within their sphere of influence at the *City of Edmonton*. They are qualified by education and experience in one or both of the professions of engineering or geoscience. *Responsible Members* (*RMs*) are formally designated by the *City*, recorded in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory", and registered with *APEGA* as *RM*s under the *City's Permit to Practice*.

4.35. Scope of Practice

A *Licensed Professional's* specific area of professional expertise in which they are competent to practise either by virtue of their training and experience or, in the case of a *Professional Licensees* and *Professional Technologists,* within their defined *scope of practice* which has been approved by *APEGA* or *ASET* (e.g., geotechnical engineering is a *scope of practice* within the *discipline* of civil engineering).

4.36. Senior Officer (SO)

An authorized designate, as named on the *Permit to Practice*, who is accountable for meeting the legal obligations of the *APEGA Permit to Practice* on behalf of the *City*. The *Senior Officer* (*SO*) does not necessarily need to be a *Licensed Professional* or hold a

specific position within the *City*'s organizational structure. The *SO* was formerly referenced as the Chief Operating Officer.

4.37. Standard Operating Procedure (SOP)

A formal document that provides a high level description of a process or procedure, often in terms of minimum requirements. A *Standard Operating Procedure* (*SOP*) generally provides a framework in which the work is to be done, usually applies in more than one instance, and may sometimes be complimented by *Work Instruction(s)*. *SOP*s often provide flexibility for individual decisions and judgements to be made within their framework due to unique and/or specific circumstances. The *City Quality Management System* details in "COE-PEG-SOP-0003 Developing and Issuing Engineering and Geoscience Quality Management System (QMS) Documents" how to develop *SOPs*.

4.38. Technical Information

Any content or data derived from the *practice of engineering or geoscience* as defined by the *Engineering and Geosciences Professions Act*. *Technical information* includes advice, analyses, assessments, calculations, designs, evaluations, inputs (e.g., to planning or to modelling and simulation), interpretations, notes, opinions, recommendations, and process descriptions.

4.39. Technical Supervisor

A *practising Licensed Professional* (*LP*) who directly oversees *Members-in-Training* engaged in engineering or geoscience, or who provides technical oversight for *LPs* or other contributors involved in the *practice of engineering or geoscience*.

4.40. Thorough Review

A process that involves exercising *due diligence* to evaluate *Professional Work Products* or other outputs confirming:

- the reliability, technical accuracy, and validity of the work
- adherence to applicable regulatory requirements, standards, and codes
- compliance with specified *Quality Control* and *Quality Assurance* processes
- compliance with contractual requirements, and
- assurance that deliverables are clear, readable, consistent, and complete

4.41. Validat(ing/e/ed/ion)

A process carried out on a *Professional Work Product* (*PWP*) that signifies a *City Responsible Member* has reviewed the *PWP* to ensure it meets the *Quality Control* and *Quality Assurance* measures described in the *Professional Practice Management Plan*. *Validation* is confirmed by the representation of the *City*'s *Permit to Practice* stamp, required information, and signature/digital certificate applied in accordance with the "APEGA Professional Practice Standard for Authenticating Professional Work Products"

and as further articulated in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products."

4.42. Work Instruction (WI)

A document that provides a detailed understanding of how specific work tasks are accomplished. A *Work Instruction* is more detailed than a *Standard Operating Procedure*. For example, describing precisely how a piece of equipment is operated or how a specific software tool is used.

5. Roles and Responsibilities

5.1. City Manager

Ultimately accountable for all employees and functions of the *City* municipal corporation as per "City Bylaw 16620 - City Administration Bylaw."

5.2. Senior Officer (SO)

Accountable to perform the following functions:

Permit Information:

- sign the *Permit to Practice* annual declaration
- ensure the annual *Permit to Practice* dues are paid
- ensure *APEGA* is notified if there are changes to the *City's* contact information
- inform *APEGA* about any changes in the assignment of the *SO*
- notify *APEGA* if the *City* is subject to a discipline decision from another Canadian provincial or territorial jurisdictional governing the *practice of engineering* or *geoscience*
- manage members in myAPEGA's company dashboard, updating information for *RMs*, *LPs,* and *M.I.T.s* as changes occur or, at a minimum, on an annual basis
- respond promptly and appropriately, or within any timeline given, to any duly served regulatory communications from *APEGA* that require a reply

Responsible Member Management:

- assign qualified and competent *LPs* to act as *RMs*
- assign a sufficient ratio of *RM*s to *LPs*, *M.I.T.*s., and individuals contributing to the *practices of engineering* or *geoscience. APEGA* recommends a minimum ratio of one *RM* to ten individuals, and the *City* is committed to adhere to this recommended ratio where appropriate. In some cases, where the practice oversight requirements are minimal, an *RM* may have more than ten individuals under their oversight
- assign *RM*s to be accountable for the *QC* and *QA* processes under which *LPs* practise engineering and geoscience

- ensure that *RM*s and the *SO* attend a *Permit to Practice* seminar within six months of being approved as an *RM* by *APEGA*, and at least once every five years thereafter
- jointly, with *RM*s, maintain an organization in which the practice of the professions is conducted in accordance with the *EGP Act* and *General Regulation*

PPMP:

- ensure that the *City* has a *PPMP* and that *LPs* and *M.I.T.s* follow it
- review the *PPMP* annually and ensure it is updated or reaffirmed annually
- ensure updates to the *PPMP* are communicated to all *LPs* and record the evidence of communication of the update

Licensed Professional and Member-in-Training Management:

- ensure that all *LPs* and *M.I.T.s* are registered, have appropriate *practising status,* and are in *good standing* with *APEGA*
- ensure that requirements in the *City*'s standards meet or exceed *APEGA*'s requirements
- ensure that the *City's PEG QMS* requirements defined in *SOPs* applicable to the overall *PEG* practice are followed
- ensure that all *practising LPs* and *non-practising* individuals using their professional designation have a designated *RM*
- ensure adherence to relevant statues, regulations, bylaws, standards, and codes

In addition to the mandatory requirements above, the *SO* encourages:

- submission of *APEGA* Summit Award nominations
- volunteer service for *APEGA*
- instilling a positive attitude towards the *EGP Act*, *General Regulation*, all other codes and guidelines, and to the role that *APEGA* plays, jointly with the *RMs*
- evaluating new *APEGA* initiatives
- supporting professional recommendations from *RMs*
- participating in and supporting *APEGA* conferences, meetings, and training events

5.3. Deputy Officer (DO)

Supports the *SO* in the functions listed in the 'Senior Officer' section. The *SO* remains accountable.

5.4. Responsible Members (RMs)

Responsible to perform the following functions:

Permit Information:

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- complete the online 'RM Declaration' form through their myAPEGA portal within 30 days of being designated *RM* by *APEGA*
- complete at least one *APEGA Permit to Practice* seminar every five years and within six months of becoming an *RM*
- respond promptly and appropriately, or within any timeline given, to any duly served regulatory communications from *APEGA* that require a reply
- notify the *SO* if they can no longer carry out the duties of a *RM*
- notify *APEGA* if they are no longer acting as a *RM* for the *City* by completing the APEGA & ASET (P.Tech.) Directory Update Form

PPMP:

- review the *PPMP* annually for ongoing maintenance and *continuous improvement*
- answer questions about the *PPMP* and ensure *LPs* and *M.I.T.s* under their area of oversight comply with it

Compliance and Oversight of Practice:

- ensure that requirements in *City* standards meet or exceed *APEGA* requirements
- ensure that all *practising LPs* in their area of oversight are registered and have appropriate *practising* status with *APEGA,* and that their entries in the "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" are accurate, complete, and up-to-date
- ensure that engineering and geoscience titles are used appropriately
- provide ongoing professional ethics oversight, including appropriate reporting of breaches of the Code of Ethics or potential risks to public safety
- ensure that the *authentication* and *validation* occurs in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products"
- when *outsourcing PEG* services for their area(s) of oversight, *RMs* are required to support their staff—including *LPs*, *M.I.T.s*, Project Managers, and any other personnel involved in project management and procurement—in ensuring compliance with the requirements of the "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience" and "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements"
- ensure that the *Practice Office* is notified of any practice-related communications with *APEGA* that they or any staff under their oversight are engaged in
- provide professional guidance and direction, without necessarily taking professional responsibility for the *technical information*
- ensure access to all applicable codes, standards, regulations, and critical practices/processes is maintained for *LP*s and *M.I.T.s* under their oversight
- support or be responsible for the development of or updates to the *PPMP*, *QMS*, *SOP*s, *WI*s, or other related documents for engineering and geoscience work for

their area of practice as well as for the overall *practice of engineering and geoscience* within the *City*

- provide support and oversight to ensure all *technical documents*, including *PWPs* and *QMS* documents, developed by and for their corresponding area, are managed in accordance with the requirements outlined in "COE-PEG-SOP-0004 Engineering and Geoscience Document Management"
- inform the *Practice Office* if they are aware of any *City* branch, department, section, or unit that may be engaged in or supporting *PEG* work without adequate oversight
- notify the *Practice Office* if their area of oversight becomes unmanageable for them
- seek guidance from the *Practice Office* on any relevant issues or concerns related to their practice, the staff under their oversight, and the *practice of engineering and/or geoscience* within the *City*
- attend and participate in *RM* meetings—**this duty cannot be delegated, attendance and/or review of minutes is mandatory.** In cases where attendance is not possible due to other commitments, *RMs* must review the meeting minutes and send a confirmation email to the *Practice Office* at pegbsa@edmonton.ca. Meeting attendance or minutes review is tracked. Quarterly *RM* meeting minutes can be found on the "PEG Practice Website"

Quality Management:

- ensure that quality is managed and maintained by following this *PPMP* and the *PEG QMS*
- actively participate and contribute to activities that support the development, implementation, and *continuous improvement* of the *City's PEG QMS*. This ensures the ongoing effectiveness, adequacy, and relevance of the *QMS* and its associated requirements
- ensure they and the *LPs* under their oversight, permanent or temporary, complete all required *PEG* training, including specific *QMS* training, and that the associated training records are maintained (See 'Section 7.7')
- **adhere to the requirements outlined in** "COE-PEG-SOP-0010 PEG Internal Practice Reviews" **during *internal practice reviews*** scheduled for their respective area(s)
- **take proactive measures to ensure completion of any *corrective action(s)*** assigned to their area by the agreed-upon estimated completion date. Refer to "COE-PEG-SOP-0011 Non-Conformance Process" for additional information

In addition to the mandatory requirements above, RMs also encourage and support:

- volunteering for various activities where the *Practice Office* requires assistance
- the *City*'s performance evaluation and professional development processes and policies for all *LP*s and *M.I.T.s*, including contract employees

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- providing meaningful employment experiences for *M.I.T.*s to facilitate their progress toward *LP* registration
- identifying professional development opportunities for *LPs* and *M.I.T.s* in collaboration with the *SO*
- collaboratively, with with the *SO*, cultivating a positive outlook on *APEGA*, the *EGP Act*, *General Regulation*, and all other applicable codes and guidelines
- participation in and support for *APEGA* conferences, meetings, and training
- conduct periodic meetings with *LPs, M.I.T.s,* and others contributing to the practices within their area of oversight. These meetings should review updates to the *PEG QMS* or regulatory requirements, share best practices, share insights and minutes from *RM* meetings, and address any issues or concerns related to the *practice of engineering and/or geoscience*

Note that *RMs*, as *LPs* themselves, assume all responsibilities outlined in the *PPMP* or elsewhere in the *PEG QMS* for *LPs*. The role of *RM* cannot be delegated to other *LP*s who are not designated as *RMs*.

5.5. PEG Practice Office

Responsible for the administration, development, maintenance, and oversight of the *PPMP*, including the communication of changes to *RMs, LPs,* and *M.I.T.s*. Also accountable for tracking and addressing comments related to *continuous improvement* of the *PPMP,* as well as drafting and ensuring its annual review, signing, and publication.

5.6. Professional Practice Leader

Responsible for overseeing the *PEG Practice Office* and for providing professional expertise, direction, and guidance in the development, implementation, and ongoing maintenance of the *City's PPMP* and the practice in general.

5.7. Licensed Professionals (LPs)

Responsible to:

- be knowledgeable of the *PPMP* and *PEG QMS*
- attest to reviewing the *PPMP* annually
- complete required *QMS* training as defined in 'Section 7.7'
- monitor and report any *non-conformance* with the *PPMP* and *QMS* to the *RM*
- maintain *good standing* status with *APEGA* and immediately notify their *technical supervisor*, *RM,* and the *Practice Office* of any changes in their *practising* status with *APEGA.* The *PPL,* at their discretion, will inform the *DO* and/or *SO*
- maintain the *practising status* with *APEGA* as is required by their position
- If an *LP* determines or has reasonable and probable grounds to believe the professional conduct or technical competence of another is in serious question, they have a clear and definite duty to inform *APEGA* accordingly. The *Practice*

Office can facilitate this and should also be informed of communications with *APEGA* that involve the *City's* practice
- ensure their entry in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" is accurate, complete, and up-to-date
- meet or exceed the requirements of APEGA's Continuing Professional Development (CPD) Program as defined by the "APEGA Professional Practice Standard for Continuing Professional Development (CPD)"
- share documented *CPD* compliance and valid entry in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" with *RM* prior to *APEGA* membership renewal
- ensure that the professional stamp issued to the *LP* by *APEGA* is used in accordance with the *EGP Act* and *General Regulation* and is safeguarded
- *authenticate PWPs* they create per "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products"

In addition to the mandatory requirements above, *LP*s are encouraged to:

- be available to mentor *M.I.T.*s
- contribute to the *continuous improvement* of the *City's* engineering and geoscience practice
- participate in technical societies related to their areas of practice

5.8. Members in Training (M.I.T.s)

*M.I.T.*s representing themselves as engineering or geoscience trainees using their trainee credentials and aiming to claim experience credit with *APEGA* for registration as part of their *City* employment are responsible to:

- be knowledgeable of the *PPMP* and *PEG QMS*
- attest to reviewing the *PPMP* annually
- complete required *QMS* training as defined in 'Section 7.7'
- monitor and report any *non-conformance* with the *PPMP* and *QMS* to their *RM*
- maintain *good standing* status with *APEGA* and immediately notify their *technical supervisor*, *RM*, and the *Practice Office* of any changes in their status with *APEGA.* The *PPL,* at their discretion, will inform the *DO* and/or *SO*
- maintain *M.I.T.* status with *APEGA* if required by their position
- ensure their entry in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" is accurate, complete, and up-to-date
- If an *M.I.T.* determines or has reasonable and probable grounds to believe the professional conduct or technical competence of another is in serious question, they have a clear and definite duty to inform *APEGA* accordingly. The *Practice Office* can facilitate this and should also be informed of communications with *APEGA* that involve the *City's* practice
- work toward obtaining registration as an *LP*

- ensure their *PEG* work is under the *direct supervision and control* of an *LP* acting as their *technical supervisor* and under the oversight of a *RM*

In addition to the mandatory requirements above, *M.I.T.*s are encouraged to:

- establish relationships with mentors to facilitate professional development and career advancement
- develop a personal program for professional development similar to *APEGA CPD*
- participate in technical societies related to their areas of practice
- participate in the M.I.T. Mentoring Group

5.9. Project Managers

Responsible for working with *LPs* in the execution of projects related to engineering and geoscience, especially in managing *consequential changes* as described in "COE-PEG-SOP-0008 Managing Consequential Changes and Record Documents" and *outsourcing* as per "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements."

5.10. Technical Supervisors

Practising LPs responsible for providing *direct supervision and control* to *non-practising* individuals, such as *M.I.T.s* and to *practising LPs* who require technical supervision, such as those just entering the profession. Experienced *LPs* can act as their own *technical supervisors*, provided they are competent and qualified, and their *RM* agrees.

5.11. City Contract Employees

All *City*'s contract employees practising engineering or geoscience must be informed about and adhere to this *PPMP.* For terms less than six months, they should work under a *technical supervisor* familiar with the *PPMP*. For terms exceeding six months, contractors must attest to reviewing and complying with the *PPMP*, have an *RM* assigned, and be entered into the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory."

"APEGA Guideline for Contract Employees and Independent Contractors" provides direction on the employment relationship and engagement issues.

5.12. PEG Job Evaluation Committee (PEGJEC)

The *PEG Job Evaluation Committee's* (*PEGJEC*'s) role is to oversee the development and maintenance of the *City's PEG* organizational structure, aligning it with the operational needs of the *City* and upholding the integrity of the *PEG* profession. The *PEGJEC* ensures the consistent application of classification levels, maintains standards for each level in engineering and geoscience, oversees the use of job titles to ensure appropriate lines of technical authority and adequate professional oversight within the organizational structure. The *PEGJEC* is also responsible for ensuring the consistency and currency of

PEG job titles and position descriptions, safeguarding that education and experience standards are not compromised.

6. Management and Organization

The *City* operates under the "Municipal Government Act of Alberta," which centers around three main areas: governance and administration, assessment and taxation, and planning and development. The *City* is led by the *City Manager*, who oversees administration, including all *City* employees. The *City Manager*'s specific powers, duties, and functions are outlined in "City Bylaw 16620 - City Administration Bylaw."

6.1. Structure

The *City* is structured with the office of the *City Manager*, and additional departments or subordinate areas as defined in the Departments and Branches section of the *City*'s website. *City* areas where engineering or geoscience is currently practised include:

- City Operations Department
- Community Services Department
- Financial and Corporate Services Department
- Integrated Infrastructure Services Department
- Urban Planning and Economy Department

As the *City* is a large and highly dynamic organization, the organizational structure is maintained in a database, currently "HumanConcepts Saba Org Planning Website."

Additionally, Edmonton Police Services and the Office of the City Auditor, although reporting to *City Council* and not part of the municipal corporation hierarchy, practise under this *Permit to Practice* and are fully accountable for compliance with the *PPMP* and *QMS* requirements.

6.2. Lines of Professional Practice and Technical Responsibility

The *City*'s register of active *RM*s, *LPs,* and *M.I.T.s* is regularly updated and can be accessed in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory." Note that an *RM* may have professional practice oversight for *LP*s beyond their organizational authority. Likewise, an *LP* may serve as the *technical supervisor* for *LPs* or *M.I.T.s* outside their direct organizational hierarchy.

The designated *RM* is responsible for ensuring the presence of adequate resources, processes, and systems to support professional practice requirements. The *RM* may designate an alternate within the business area to fulfill these responsibilities. The *technical supervisor* will provide technical review, *direct supervision and control*, and necessary mentoring to their *LPs* and *M.I.T.s*.

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Project-specific organizational structures, which include lines of technical responsibility and communication between the *RM*s, *LP*s, and *M.I.T.*s, are included in the Project Charter, a requirement for all capital projects as per the internal 'Project Management' system.

Experienced *LPs* typically make technical decisions in their respective areas of work in collaboration with their *technical supervisor* and/or *RM*. In the event of disagreement, *RMs* and *technical supervisors* encourage and mediate an informed discussion. If consensus cannot be reached on technical decisions related to engineering or geoscience, the final decision-making authority rests with the most organizationally senior *LP* among the *PPL, DO,* or *SO.*

6.3. APEGA & ASET (P.Tech) Member Directory

The "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" must include all individuals currently employed by the *City* who hold registration or enrollment with *APEGA* (all categories of membership) or *ASET* (*P.Techs*). This requirement applies regardless of whether their specific position description or role requires a professional designation. Each entry includes:

- Name and designation (if any)
- position title
- *APEGA* or *ASET* ID, if applicable
- Post secondary, *discipline,* and area of practice
- reporting supervisor, *technical supervisor*, and *RM*
- whether or not the member is executing professional practice or in training at the *City*
- whether or not the member is using their professional or 'in-training' designation at the *City* (P.Eng., P.Geo., M.I.T., etc.)
- *APEGA* or *ASET* professional status information
- *RM* status and the date they last attended a *Permit to Practice* seminar, if applicable
- *CPD* compliance date, which is the last day of *CPD* reporting period for *LPs*
- *PPMP* attestation or formal confirmation of having reviewed the current *PPMP*

7. Management of Professional Resources

7.1. Hiring Professional Staff

Human Resources (HR), operating within the Employee and Legal Services Division, is responsible for developing and implementing all hiring policies and procedures. Job classifications for engineers and geoscientists fall under the Professional Engineer and Geoscientist job stream in accordance with the "Terms and Conditions for Management

and Exempt Employees - Attachment 4 - Professional Engineer and Geoscientist Pay Administration Guidelines and Job Evaluation."

To maintain the accurate usage of reserved titles, the *City* has established several measures. These include HR and compensation processes, the *PEGJEC,* which adheres to established guidelines for classifying engineering and geoscience positions, oversight from supervisory and leadership teams, and the documentation of *RM* responsibilities during *RM* meetings.

Through these departments, processes, guidelines, and oversight responsibilities, the *City* ensures that the job descriptions mandate the necessary experience and professional registration status and that job titles are compliant.

7.2. Compliant Job Titles and Positions

Engineering and geoscience job titles must adhere to *APEGA* requirements and the regulations outlined in the *EGP Act* and *General Regulation* exclusively for their use.

7.2.1. New Hires and Reclassifications

The *PEGJEC* and HR ensure that only those individuals authorized to use engineering and geoscience titles and designations do so only in accordance with *APEGA* requirements and the *EGP Act* and *General Regulation.* The *PEGJEC* assesses each new or reclassified engineering or geoscience position to assign the appropriate responsibility level and title. HR also reviews each Position Description for new positions and reclassification requests to ensure compliance with classification requirements. Additionally, HR examines qualifications for new positions and incumbent qualifications for reclassified positions, verifying that candidates or incumbents hold the necessary credentials for their roles.

7.2.2. Use of Non-Compliant Job Titles by the Corporate Workforce

At the *City*, there are thousands of employees, the majority of whom have control over their signatures and corresponding signature blocks in emails, memos, and letters. Although infrequent, the misuse of a regulated or reserved title by an individual is a possibility. Restrictions regarding compliant job titles are discussed during *RM* meetings and documented in the meeting minutes.

If the inappropriate use of a reserved title is observed or suspected, it is everyone's responsibility to report the issue to an *RM* and the *Practice Office. RMs* are responsible for checking the "City of Edmonton - APEGA & ASET (P.Tech) Member Directory." If the employee is not an *APEGA* or *ASET* member, the *RM* is expected to report the matter to the employee's business area and the *Practice Office* for follow-up and action.

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7.2.3. M.I.T Positions

APEGA specifies that *M.I.T.*s may use the word "engineer" or "geoscientist" in their title, provided it is followed by the phrase "in-training." HR and their reporting supervisor and *technical supervisor* must ensure that the job title of *M.I.T.*s complies with *APEGA* requirements, the *EGP Act*, and the *General Regulation.*

If a position requires an *M.I.T.* designation, then members holding this designation and their *technical supervisor* must ensure these designations remain active and are not expired, as this can affect employment status. It is important to note that the *M.I.T.* designation expires after six years according to legislation, but may be extended up to eight years with *APEGA* registrar approval.

7.2.4. LPs in Positions that do not Require a P.Eng. or P.Geo Designation

LPs can occupy *City* positions that have not been classified as requiring a professional engineering or geoscience designation from *APEGA*. Examples include when engineers or geoscientists are hired into technologist positions, non-engineering project management, auditor, or senior management roles.

In such cases, *LPs* may use their professional designation within their *City* employment, provided they meet the following conditions:

- they maintain *good standing* status with *APEGA*
- they are listed on the *City's Permit to Practice* and have an entry in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory"
- if the *LP* is performing any work that falls within the scope of *practice of engineering or geoscience*, they must also have *practising status* with *APEGA* and a *technical supervisor* assigned. They must first discuss this practice with an RM and *technical supervisor*
- they have an *RM* assigned
- they complete annual *QMS* training requirements as defined in 'Section 7.7'

Important Clarification: *LPs* employed in non-designated positions and who are not practising engineering or geoscience do not need to use their professional designation in their *City* employment. In these cases, these individuals will be removed from the *City's Permit to Practice* but should still be included in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" for tracking purposes. These individuals are not subject to *QMS* training requirements.

7.2.5. Joint Practice Positions

The *City* has some positions that require a professional designation from a specified roster of acceptable designations as defined in a joint practice

agreement between *APEGA* and (an)other organization(s). For example, environmental positions related to contaminated site assessment and remediation, are subject to the requirements of the "Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta - Joint Practice Standard," which requires one of seven professional designations including engineering or geoscience. In these situations, the position will remain classified as *PEG* regardless of what specified and required designation the successful candidate holds.

7.3. Maintaining Good Standing Status and APEGA Designations

LPs and *M.I.T.*s, listed on the *City*'s *Permit to Practice* and who use their professional designation in the context of their *City* employment are required to maintain *good standing* status with *APEGA* as per the "APEGA Good Standing Policy."

Individuals must ensure their membership dues and the required *CPD* activities are completed annually by the specified deadline. Failure to pay dues, comply with *APEGA's CPD* program, or submit 'Annual Declaration' and/or Personal Annual Competency Evaluation (PACE) plan declaration to *APEGA* by the due date can lead to the loss of *good standing* status and potential loss of *APEGA* licensure. This puts the individual and the *City* at a significant liability risk. If the loss of *good standing* remains unresolved, they will be removed from the *City*'s *Permit to Practice* and the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory."

If an employee is in a role that requires an *APEGA* designation, and the employee loses this designation, the employee must inform their *technical supervisor*, *RM*, and the *Practice Office* immediately. The *PPL* will inform the *DO.* Failure to inform or maintain any required *APEGA* designation may result in discipline up to and including termination.

7.4. Restrictions on Practice After Resignation or Cancellation

Individuals whose membership in *APEGA* or *ASET* has been resigned or canceled are prohibited from *practising* engineering or geoscience in Alberta. This includes working under the supervision or direction of a *practising Licensed Professional*. This restriction is outlined in the *Engineering and Geoscience Professions Act*. Engaging in unauthorized practice may result in disciplinary action, fines, and legal repercussions. Resignations or cancellations must immediately be reported to the *Practice Office.*

7.5. Performance Review

The *City*'s performance review processes for management of professional employees and in scope (unionized) staff are documented in the Employee Performance Management section of the "OneCity intranet." *LPs* fall primarily in the former group, however, both types of positions have similar Performance Contribution Plans or Goals and Results tools and processes with supporting resources.

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7.6. Learning and Development

Each year, *LPs* and *M.I.T.s* discuss with their reporting supervisor on what learning may be completed in the upcoming year. Where possible, *technical supervisors* should also be consulted. Professional development and learning needs are also assessed throughout the year on an as-needed basis. In addition to opportunities for external training, the *City* offers a wide range of professional development courses through its internal "Learning Management System." Refer to "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System" for additional details.

7.7. Mandatory Annual QMS Training

QMS training requirements may vary annually and are communicated by the *Practice Office.* Each individual is responsible to complete assigned *QMS* training, which can be found on the "PEG Practice Website" under Current QMS Training. *RMs* are accountable to ensure individuals under their oversight have completed assigned training. At a minimum, training includes annual *PPMP* attestations and assessments, and then varies depending on whether or not individuals are practising engineering or geoscience in their roles. To ensure appropriate professional conduct, the training requirements differ for:

- **professional designation held, but not used:** Individuals who hold an *APEGA* or *P.Tech. ASET* designation but do not use it while in their *City* role and are not performing engineering or geoscience work for the *City* are not required to complete *QMS* training
- **professional designation used but none of the work is considered practising:** Individuals who use their *APEGA* or *P.Tech. ASET* designation in their *City* role but are not performing engineering or geoscience work (See 'Section 7.2.4') are required to complete targeted *QMS* training and attestations as defined on the website
- **professional designation used and some or all of work is practising:** Individuals who use their *APEGA* or *P.Tech. ASET* designation while performing engineering or geoscience work for the *City* are required to comply with the *QMS* including all mandatory training and attestations as defined on the website

7.8. Continuing Professional Development

Ensuring that *LPs* meet their *APEGA CPD* requirements is the legislated responsibility of the individual *LP*. All *LPs* must meet the requirements mandated in "APEGA's Professional Practice Standard for Continuing Professional Development (CPD)." The *CPD* practice standard comprises two components, learning modules and Personal Annual Competency Evaluation (PACE) plan, that must both be completed annually. *LPs* can access the learning modules available through their myAPEGA portal Learning Management System (LMS). *LPs* are also required to undertake *CPD* activities to maintain and enhance their continuing competence and to document it in their PACE plan. "APEGA Professional Practice Guideline Personal Annual Competency Evaluation

(PACE)" provides recommendations for creating and maintaining a PACE plan in compliance with the *CPD* practice standard. It is recommended to use APEGA's PACE plan template to ensure requirements of the *CPD* practice standard and recommendations from the PACE practice guideline are addressed.

No formal review of an *LPs* PACE plan is conducted by the *City*. *RMs* or *technical supervisors* within the *City* may review the PACE plan of another *LP* if requested by the *LP*. Since not all *LPs* or *M.I.T.*s report to *RM* supervisors, they may choose to review their *CPD* program with their *technical supervisor*, the relevant *RM*, or establish a relationship with a mentor. All *LPs* must update their *CPD* compliance attestation annually in the "City of Edmonton - APEGA & ASET (P.Tech) Member Directory."

7.9. Onboarding LPs and M.I.T.s

The *Work Instruction* (*WI*) "COE-PEG-WI-0009 Onboarding & Offboarding APEGA and ASET (P.Tech) Members" provides a comprehensive list of the training, assessments, and other requirements for the overall *practice of engineering and geoscience* and must be referred to for ensuring the necessary actions are taken when onboarding or offboarding a *City* employee who is an *APEGA* member. *RM*s, *LPs*, and *M.I.T.*s are required to complete the applicable *QMS* training as defined in 'Section 7.7' assessments and other requirements provided in the *WI* in addition to any Section- or position-specific training.

7.10. Membership Fees

The *City* pays for professional membership dues where a professional designation is required by the position description. In *non-practising* positions, the *City* typically covers *APEGA/ASET* membership fees only for individuals who support engineering or geoscience work as part of their duties. In any other situation, fees are handled on a case-by-case basis and decisions are handled by the budget holder of the respective Section or unit.

As part of the payment process, the *LP* must provide proof of completion of their 'Annual Declaration' or PACE plan declaration and confirm their *CPD* compliance date entry in the internal "City of Edmonton - APEGA & ASET (P.Tech) Member Directory" is current before the dues are paid. *RMs*, supervisors, or whoever processes the fees must address any failure to provide the required documentation before processing the dues.

8. Management of Technical Resources

8.1. Practice References and Resources

The *City* provides access to an appropriate library of regulations, codes, standards, and references (NRC, CSA, ASHRAE, API, ASME, etc.). They are available through various methods, including:

- physical or electronic copies in possession of individual *RMs* or *LPs*
- physical or electronic copies in Section-level libraries or directories
- electronic copies available via online, shared subscription services, identified in Codes & Standards Library.
- other access through library arrangements or access to Edmonton Public Library, University of Alberta, etc.

The *City* also has reference Design and Construction Standards and various Consultant Manuals, which are located in the "CoE - TriDocs." As applicable, many of these are also externally published on the "City Design and Construction Standards Webpage" for public access.

LPs who require additional reference material to complete *PEG* work are expected to contact their *RM* or *technical supervisor*. *RMs* are responsible to maintain a basic awareness of the applicable regulations, codes, and standards for their areas of oversight. The *RM* and/or the *technical supervisor* will make these available and will communicate any updates or changes to the codes and standards to those under their oversight. It is also the responsibility of the *LP* to be aware of the applicable regulations, codes and standards related to the work.

8.2. Standard Contract Forms and Conditions

The *City's* standard contracts and conditions are maintained and administered by Corporate Procurement and Supply Services (CPSS), within the Financial and Corporate Services Department. All relevant documentation and supporting resources are found on the internal "Procurement and Contract Management Webpage."

Departures from standard conditions and non-routine work are reviewed by the Legal Services Branch and the Risk Management Section.

When work is procured that contains or may contain professional engineering or geoscience, it must comply with "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements."

8.3. Information and Communication Technology (ICT) Policy

The Open City and Technology (OCT) Branch, within the Financial and Corporate Services Department, is responsible for developing and administering the *City*'s ICT

policies and administrative directives. These include requirements for acceptable use of *City* ICT assets, as well as protocols for ensuring the security of physical assets and data:

- "City Standard - Code of Conduct"
- "City Administrative Directive A1442B - Information Technology Hardware and Software Non-Standard Request"
- "City Administrative Directive A1429D - Acceptable Use of Communication Technology"
- "City Administrative Policy A1473A - Cyber Security"

8.4. Laboratory and Testing Equipment or Services

Many Sections make extensive use of laboratory and testing equipment or services in carrying out their functions. If sub-contracting these services outside of the *City,* proof of calibration and certification must be provided as applicable. If an area has its own laboratory and testing equipment supporting professional work, it must be suitable for the activities performed.

The responsibilities for the *RM,* or an individual they select within the Section, include:

- ensuring laboratory and testing equipment is operated safely and appropriately, following all required operating procedures
- ensuring the equipment is in good repair, with any necessary maintenance plans or procedures in place
- ensuring the equipment meets industry standard for certification and calibration
- maintaining an inventory of all equipment, along with maintenance and calibration records

LPs should consult with the appropriate *RMs* for their Section to determine the preferred or approved source of laboratory and testing equipment. In addition to the above requirements, "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System" has additional requirements related to *verification* and modification of software, equipment, and tools.

8.5. Software Resources

As part of "COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering and Geoscience Software," a list of *PEG* software used in the *City* is maintained and updated as more *PEG* software is identified and evaluated in 'Attachment 1: List of Evaluated Software Resources.'

9. Professional Business Practices

9.1. Quality Management

The *City* strives to ensure all *PEG* work performed is properly defined, is undertaken by competent personnel, and meets applicable regulations, codes, standards, and other

relevant specifications. Additionally, it includes provisions for adequate oversight, *Quality Assurance*, and specific requirements for documentation. The *City's* "OneCity intranet" and the "PEG Practice Website" provide necessary information and tools to manage the *PEG* practice.

The *QMS* consists of this *PPMP,* "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," and all the relevant *SOPs* applicable to the overall *PEG* practice, accessible in "CoE - TriDocs." *LPs* and *M.I.T.s* are required to adhere to both *SOP* requirements applicable to the overall *PEG* practice, and Section-specific *QMS* processes relevant to their respective Sections.

Non-conformances arise when these *QMS* or regulatory requirements are not met. "COE-PEG-SOP-0011 Non-Conformance Process" outlines the process for documenting, monitoring, and managing *non-conformances,* including associated *corrective* and/or *preventive actions*. Identifying *non-conformances* is vital to ensuring an effective *QMS.*

The effectiveness of the *QMS* must be continuously evaluated. The methods for conducting this evaluation are described below.

In addition, it is expected that learnings from the methods below will assist in the *continual improvement* of the *QMS* system and the *PEG* work carried out within the *City.*

9.1.1. Internal Practice Reviews

Internal practice reviews are managed by the *PEG Practice Office* and identify *Opportunities for Improvement*, *non-conformances*, and best practices of Sections practising engineering and geoscience at the *City*. The requirements are outlined in "COE-PEG-SOP-0010 PEG Internal Practice Reviews." The objective of conducting *internal practice reviews* is to measure the *City's* practice against this *PPMP*, *QMS*, and regulatory requirements.

9.1.2. APEGA Practice Reviews

APEGA is authorized to conduct practice reviews of the *City* and the *LPs* and *M.I.T.s* employed by the *City*. *APEGA* conducts practice reviews to ensure the *practices of engineering and geoscience* are carried out in accordance with the *EGP Act*, the *General Regulation,* and *APEGA* professional practice standards, bulletins, and guidelines.

9.1.3. Other Sources

"COE-PEG-SOP-0011 Non-Conformance Process" outlines the various sources of *non-conformances* within the *QMS*. These deviations may be identified and reported by any individual aware of the deficiencies or deviations from *QMS* requirements or applicable regulations.

9.2. Project Management

The *City*'s direction for capital project management is outlined in "City Standard - Project Management for Capital Projects" and is applicable to all *City* departments and staff reporting to the *City Manager* working on capital projects. Project management practices for capital projects must follow best practices but are flexible to accommodate individual business areas and different project delivery methods. Different areas of the *City* use different practices and tools for project management and these are described in the Project Management page on "OneCity intranet."

For example, in Integrated Infrastructure Services, Project Managers are required to follow the "Project Management Reference Guide (PMRG)," which was developed within the *City* to align with typical construction project lifecycle: concept, design, and build.

The PMRG combines the *City's* project management best practices with the Project Management Institute's Project Management Body of Knowledge. The PMRG outlines steps and processes for various knowledge areas (or domains) including integration (project initiation, change management, and closeout), scope, schedule, cost, communication, risk, safety, quality, procurement, finance, human resources, environmental, and claims management. The guide is an aid with a standardized methodology for the planning, execution, and control of the above knowledge areas. Within the guide, detailed processes, steps, tools, templates and/or checklists have been defined to support the delivery of projects.

The guide specifies that the project quality team, as defined in the project management plan, is responsible for quality management, inspection, measurement, and testing the contractor's work against the standards and requirements. Additionally, it identifies the causes for any deviation from the standards.

When executing *PEG* projects, *LPs*, with the support of their *RMs* and the appropriate Project Manager, must also ensure:

- the scope of the professional work, including the scope of *professional services*, is defined and documented, including assumptions and limitations of work
- appropriate communication plans exists and information, especially related to the expectations regarding *professional services*, is communicated to the stakeholders throughout the project
- all *professional service* output deliverables requiring *authentication* and *validation* are identified throughout the project
- appropriate and adequate policies and procedures for change orders and change management are in place and agreed upon to ensure impacts to *professional services* and *PWPs* are considered and *authenticated* and *validated*, if required

- appropriate resources are in place to carry out the professional responsibilities for the project
- appropriate risk assessments related to the *practices of engineering and geoscience* are completed and documented

When external entities execute *PEG* projects for the *City*, the Business Area Purchaser or Project Manager procuring the services must also comply with *outsourcing* requirements (see 'Section 14').

9.3. Handling Confidential Materials and Intellectual Property

The *City* requires all employees to adhere to "Access to Information Act (ATIA)" and "Protection of Privacy Act (POPA)" concerning the handling of confidential or sensitive information, as well as timely disclosure of relevant information to the public when requested, ensuring compliance with the Acts. All employees must safeguard such information in accordance with the Acts and consult with a POPA privacy officer and/or an Access to Information (ATI) coordinator before releasing potentially confidential, sensitive, or protected information, including intellectual properties of clients, service providers, or citizens. Additional information is available in "City Administrative Policy A1477 - Data and Information Management."

9.4. Negotiating and Contracting Services

Procedures, processes, and guidelines for procurement (including trade agreements) are detailed in the "Procurement Standard - City of Edmonton" with other resources linked though the "Procurement and Contract Management Webpage" and the "CPSS Training and Reference Material Webpage." For *PEG* services *outsourced* to external entities, also refer to 'Section 14' for requirements.

Additionally, *LPs* are encouraged to reference "APEGA Guideline for Selecting Engineering and Geoscience Consultants" for information about best practices related to qualifications-based selection. Construction and operational services are also often required from outside vendors for many of the *City's* new and existing facilities.

Policies and procedures regarding dispute or conflict resolution between professionals and with clients are developed and maintained by both CPSS and the Legal Services Branch, Financial and Corporate Services Department and defined in contracts. Also refer to best practices related to conduct toward others in "APEGA Guideline Ethical Practice."

9.5. Conflict of Interest, Gratuities, and Other Employment

Policies and guidelines regarding conflict of interest, including handling of gifts and gratuities are outlined in the "City Standard - Code of Conduct." Specific policies are developed and maintained by both the Human Resources Branch and the Corporate Security Section of the Legal Services Branch. Finally, specific groups, such as Sections or

Branches, are encouraged to implement guidelines to ensure common expectations, understanding, and fairness among employees and external partners.

LPs and *M.I.T.s* must acknowledge conflicts of interest can influence their objectivity and affect the practices of the professions, as described in "APEGA Guideline Ethical Practice," and must declare their conflicts of interest.

A perceived conflict of interest exists when a *City LPs* practise engineering or geoscience for external entities. *City* employees engaging in engineering or geoscience activities for external entities are required to consult the *City's* "Code of Conduct" for information pertaining to other employment. In such cases, they must:

- clearly communicate any real or perceived conflicts of interest to the *City* by filling out the conflict of interest disclosure form in the "Code of Conduct"
- ensure they possess professional liability insurance for external work
- adhere to both the *City's* "Code of Conduct" and the APEGA Code of Ethics
- acknowledge that discipline decisions or orders issued by *APEGA* or another regulatory body for work performed on behalf of external entities may impact their employment at the *City*

Furthermore, if *LPs* or *M.I.T.s* change positions within or outside the *City*, it is their responsibility to reassess real or perceived conflicts of interest and inform the *City* as defined in its "Code of Conduct."

9.6. Coordination of Multi-Disciplinary Teams and Teamwork

In each Section within the *City* practising engineering or geoscience, distinct processes are in place for the production, review, and *authentication* of *PWPs*, involving the coordination of multi-disciplinary teams and teamwork. As part of this process, the *RMs* or their designates are responsible for ensuring competent project teams are created to coordinate multidisciplinary work. This includes identifying and assigning appropriate technical resources, including *LPs*.

Team members are accountable to an *LP* and are responsible to represent the views of their co-workers and their *discipline*, to ensure that their work is completed to an adequate standard, and to ensure that their work integrates into the overall multi-*discipline* project. Project Managers are responsible to provide coordination of the team's efforts, to provide leadership, and to communicate the project's activities and progress to the affected parties.

Project and design reviews are performed by the team and signed off by each *discipline* team member at the completion of major milestones.

LPs practising in the areas of civil, structural, chemical, electrical, electronics, environmental, fire protection, geotechnical, geoscience, geomatics, mechanical, surveying, and transportation engineering are employed by the *City* and consult on

projects and initiatives when required. Routine circulations to all applicable groups are conducted at the project development stage to seek comments about the need for *LP* involvement in the project. Appropriate *LPs* are also available to participate in *PEG* consultant selection and the development of work scopes as needed.

9.7. Risk Management

The management of corporate risks is through a formal Enterprise Risk Management (ERM) framework and the process is key to identifying, assessing, managing, and reporting on enterprise risk associated with the *City*'s business and strategic goals in a systematic, consistent, and transparent manner. This framework is endorsed by the *City Council* in "Council Policy C587A - Enterprise Risk Management," which outlines responsibilities for creating a culture and philosophy that supports a formal ERM.

The objective of the capital project risk management aspect of the *City*'s Project Development and Delivery Model, articulated on the "Project Management Reference Guide (PMRG) Webpage," is to identify potential project risks, thereby decreasing the likelihood and extent of their impact (minimize negative impacts, maximize positive impacts) on meeting the project objectives. Project risk follows the *City's* ERM model, while focusing on risks within a project delivery context. The level of formality of the process depends on the nature of the project, the method of delivery, the technology, the project team, the risk tolerance of the project owner/sponsor, and any external economic, environmental, social, cultural, and political conditions. Project risk management processes are:

- Risk Planning
- Risk Identification
- Risk Assessment
- Risk Response
- Risk Monitoring and Control

Project risk likelihood, probability, and impact ratings have been adopted from the ERM framework.

9.8. Advertising and Corporate Promotion

Policies, procedures, and guidelines regarding advertising and corporate promotion are developed and maintained by the Communications and Engagement Department and should follow the best practices in "APEGA Guideline Ethical Practice."

10. Verification, Authentication, and Validation

All *PWPs* must be *verified*, *authenticated* and *validated* as required by the "APEGA Professional Practice Standard for Authenticating Professional Work Products" and "APEGA Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings." This includes

any output from the *practices of engineering or geoscience* that meets each question in the three-part test:

- does the output contain *technical information*?
- is the *technical information* complete and final for the intended purpose of the output?
- will others rely on the *technical information* related to the output's intended purpose?

Furthermore, any artifacts produced for or under the authority of a legislative body or AHJ may also require professional *authentication* and *validation.* To comply with governing laws, codes, or standards, this work must be *authenticated and validated* by the appropriate *LP* and *RM*. *PWPs, record documents* and related *technical documents* must be controlled, retained, and accessed according to the "COE-PEG-SOP-0004 Engineering and Geoscience Document Management."

RMs are responsible to ensure *PEG* work produced within their areas of oversight meets the necessary standards to fulfill the requirements of *verification* and *authentication* before they *validate*. The *RM* must act on any reported deficiencies.

LPs and *RMs* should be aware that failure to *authenticate* and *validate* any artifact that would be deemed a *PWP* does not absolve nor diminish the liability of the *LP* or the *Permit Holder.* Such non-compliance is also a direct contravention of *APEGA's* practice standards and the legislation.

Refer to "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" for detailed requirements and procedures.

The *City* does not create *PWPs* destined to be used outside of Alberta.

10.1. Use of Professional Engineering and Geoscience Software

*RM*s must ensure *PEG software* used by *LPs* in the completion of engineering or geoscience designs or analysis meet the requirements of "COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering and Geoscience Software." In addition, *PEG software*, such as a custom spreadsheet that performs calculations or modeling, is considered a 'digital' *PWP* and Project Managers and *LPs* must ensure it is *authenticated* and *validated.*

LPs are responsible to understand the application and limitations of the *PEG software* used in the performance of their work and to verify any results obtained from this software are reliable and valid. *LPs* must practise *due diligence* by verifying results utilizing first principles and checking to ensure that the *PEG software* is appropriate for the intended use and that its release has been certified for general use.

Many Sections rely on *PEG software* to perform their functions If applicable, the *City* requires proof of *PEG software authentication* and *validation* as part of these services.

10.2. Control of Professional Stamps

An *LP* is responsible for safeguarding both their physical professional stamp and their *digital signature* certificate at all times. The physical professional stamp must remain under the *LP's* direct control, preventing unauthorized use. When housed in a *City* building, the stamp must be stored securely.

For *digital signature* certificates, the *LP* must secure their sign-in credentials, and **never** share them. While maintaining strict control of graphical representations is not feasible, *LPs* must ensure blank professional stamps are never present on *PWP* drafts before *authentication.* This also applies to electronic files, except just before printing for *wet signature* application. Stamp graphics should be removed from any electronic files after printing.

LPs must ensure a delegation of authority memorandum is written and signed when assigning the application of stamp graphics to others. **Delegating the application of digital identity certificates is strictly prohibited.** Both electronic graphics and physical stamps are *APEGA's* property, and physical stamps must be returned to *APEGA* upon request.

10.3. Control of Permit to Practice Stamps

The *City* no longer maintains any physical *Permit to Practice* stamps and does not allow their use. All representations of *Permit to Practice validation* must be via the properly *wet signature or digitally signed* graphics. While maintaining strict control of graphical representation is not feasible, *RMs* must ensure that blank *Permit to Practice* stamps are never present on *PWP* drafts prior to *validation.* This also applies to electronic files, except just before printing for *wet signature* application. Permit graphics should be removed from any electronic files after printing.

Access to the graphical representation of the *City Permit to Practice* stamp is available to *RMs* only. Preferably, for *digital signing*, a customized version should be obtained from the *PPL* in the *Practice Office.* Customized versions are created for particular *RMs*, with their names and *APEGA* ID inserted. Alternatively, the blank master copy of the *Permit to Practice* stamp in this file location may be shared with only *RMs* and should not be redistributed or forwarded unless properly delegated as noted below.

*RM*s must ensure a delegation of authority memorandum is written and signed when assigning the application of stamp graphics to others. **Delegating the application of digital identity certificates is strictly prohibited.** Both electronic graphics and physical stamps are *APEGA's* property, and physical stamps must be returned to *APEGA* upon request.

11. Overlapping Areas of Practice

Overlapping practice exists when work can be performed by *LPs* or other professionals certified with professional associations.

For example, "APEGA's Joint Practice Standard Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta" states there are different AHJ's over reclamation and remediation work in Alberta, and the professionals doing the work require appropriate education, training, and experience. The standard defines "professional members" as professional engineers/geoscientists, licensees, professional licensees, professional agrologists, registered technologists (agrology), professional biologists, professional chemists, professional foresters, registered professional forest technologists, or professional technologists and lists the various Acts that regulate such professionals.

"APEGA's Joint Practice Standard Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta" recognizes the interdisciplinary nature of wetland science, design, and engineering in Alberta, and describes the professionals who can *authenticate* wetland related documents.

Even though overlapping practice can be undertaken by other types of professionals, if an *LP* does the work, they must *authenticate* and *validate* to comply with *APEGA's* requirements as they are subject to the *EGP Act*, *General Regulation*, and all *APEGA* requirements. As a *Permit Holder*, the *City* should still have an *RM* or *LP* involved in the overlapping work of other professionals, and ensure other professionals are stamping or approving the work in compliance with their professional or regulatory bodies. Doing so ensures the appropriate *due diligence* has been undertaken and that the practice is recognized as overlapping.

12. Relying on the Work of Others

All *LPs* must review their detailed responsibilities outlined in the "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience." *LPs* must use *due diligence* when providing *direct supervision and control* to ensure active involvement and responsibility in decision-making. Documented evidence of these elements must be kept to comply with *APEGA's* standard and with "COE-PEG-SOP-0004 Engineering and Geoscience Document Management."

LPs must review the work completed under their *direct supervision and control* on a regular basis to verify that it is technically correct and that the appropriate codes, standards, and regulations are being applied. Deficiencies must be identified, documented, and corrected by the *LP*.

If the *LP* is incorporating work supplied by others not under their *direct supervision and control*, previously *authenticated PWPs*, or non-*authenticated* work products in the preparation of a new *PWP,* they must ensure that the work they are relying on is current, appropriate, and adequate for the purpose intended. The *LP* must follow "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" and *thoroughly review*

the final, integrated *PWP* prior to assuming professional responsibility by *authenticating* it. If applicable, ongoing or unresolved deficiencies must be reported to the *RM* providing oversight for the work supplied.

Use of specifications prepared by outside suppliers may be accepted by the *LP* if appropriate and sufficient information is available to determine suitability for the application intended.

If *professional services* are procured outside of the *City,* refer to the 'Outsourcing Professional Services' section in this document.

13. Development and Use of Design Standards

Design standards are the guidelines, procedures, rules, or principles that steer the creation of a typical, repeatable design, construction, operation, maintenance, or retirement of facilities and infrastructure in accordance with applicable codes and regulations. Prior to the *authentication* and issuance of a design standard that the *LP* takes responsibility for, the *LP* must ensure:

- the *City* has the appropriate resources to develop and maintain the design standard
- the design standard's intended use and limitations are clearly outlined
- uncertainties are addressed prior to issuing the design standard
- the design standard is *verified*, *authenticated*, and *validated* in accordance with the 'Verification, Authentication, and Validation' section

Industry and internal *City* design standards may be applied routinely without a requirement for the *LP* to confirm the information contained in the standard provided the standards are used within their intended parameters.

Many Sections rely on external consultants to prepare *PEG* specifications and standards, often by *outsourcing* these *professional services*. Refer to 'Outsourcing Professional Services.'

14. Outsourcing Professional Services

Professional services that are procured from outside sources must meet the *City's* standards and specifications for contracting such work (refer to 'Negotiating and Contracting Services' and the "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience.)" *Outsourced* work falls under one of the following scenarios:

- *outsourcing* to an *APEGA LP* or *Permit Holder*
- *outsourcing* to an entity not licensed by *APEGA*

Regardless of the scenario, an applicable *outsourcing* form must be completed:

- COE-PEG-FORM-0002 PEG Outsourcing Form - Standalone Contracts for PEG Services
- COE-PEG-FORM-0003 PEG Outsourcing Form - Standing Arrangement for PEG Services
- COE-PEG-FORM-0004 PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services

If *PWP*s are produced by an *outsourced entity*, they must be *authenticated* and *validated* by an *APEGA LP* according to the "APEGA Professional Practice Standard for Authenticating Professional Work Products" and *due diligence* must be exercised and documented. The *outsourcing* process and requirements for both scenarios are fully described in "COE-PEG-SOP-0009 Engineering and & Geoscience Outsourcing Requirements."

If an *LP* or Project Manager has uncertainty regarding requirements when *outsourcing professional services,* they must bring this to the attention of the *RM*. The *RM* and the *LP* must jointly evaluate and initiate the appropriate action required to ensure that the quality and acceptability of the work is adequate for the intended application.

When *outsourcing* services in areas of overlapping practice, as described in section 'Overlapping Areas of Practice,' an *LP* can use their professional judgement to determine if the work falls into overlapping practice and whether or not the work can be performed by others defined in *APEGA's* joint practice standards.

15. Environmental Management

The *City* is committed to environmental protection and employs subject matter experts in environmental science and engineering. Many *City* projects and operational activities are focused on environmental protection. Information for guidance to ensure that environmental aspects are properly addressed includes:

- "APEGA Guideline for Environmental Practice"
- "City Bylaw 7188 - North Saskatchewan River Valley - Area Redevelopment Plan"
- "City Policy C505 - Edmonton's Environmental Management System"
- "Council Policy C512 - Environmental Policy"
- "Council Policy C627A - Climate Resilience"
- "Council Policy C571 - Brownfield Remediation and Redevelopment Support"
- "Edmonton City Plan"
- "Enviso - Edmonton's Environmental Management System"
- "City Policy A1427 Environment Protection, Compliance and Reporting"

16. Technical Records and Document Management

16.1. Records Policy

The *City* produces important legal, contractual, design, and operational records. These artifacts are managed and preserved through a combination of a Corporate Records Management program, overseen by the Office of the City Clerk, and many secondary archival systems held by the appropriate departments.

Records are kept for a variety of reasons:

- to support business operations
- as proof of business decisions and transactions

- to comply with legislation
- to protect the rights of citizens and the *City*
- as proof of accountability or compliance with other business requirements
- for future business, financial, legal, research, or archival reference

City Corporate data and assets are governed by:

- "City Administrative Policy A1477 - Data and Information Management"
- "City Administrative Directive A1433A - Privacy"

16.2. PEG Technical Document Management

The "COE-PEG-SOP-0004 Engineering & Geoscience Document Management" establishes requirements for the identification, storage, protection, retrieval, retention, and disposition of *technical documents* (includes *PWPs,* other related documents, and *QMS documents).* Refer to this policy for requirements that must be met. The *SOP* also includes a list of currently known *Electronic Document Management Systems*.

LPs are responsible to ensure appropriate and sufficient records are produced and maintained in a manner acceptable to their scope of work. *LPs* must determine what level of documentation is sufficient to support their recommendations and actions.

For the *practice of engineering*, such documentation could include: engineering plans, drawings, specifications, tender documents, contract purchase orders, notices of proposed change, contracts, investigations, engineering or geoscience reports, design and design changes, engineering and geoscience recommendations, field inspection reports, shop drawing reviews, progress certificates, construction completion certificates, *as-built documents/drawings, record documents/drawings*, etc.

For the *practice of geoscience,* such documentation could include geological cross-sections, groundwater monitoring reports, borehole logs, laboratory reports, control charts, soil management plans, and soil quality assessments, etc.

Original, *authenticated PWPs* produced by *LP*s during their employment with the *City* must remain on the *City*'s records and may be relied upon by the *City* for any future projects. The *LP* is entitled to a copy or instance of their *authenticated* work if they are no longer employed with the *City*.

City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Engineering & Geoscience Quality Management System

Document #: COE-PEG-SOP-0002

Version: 03

Authorized By:

Nicole Wolfe	2023-11-29	
Name	*Date*	*Signature*

Acting Branch Manager, Building Great Neighbourhoods, & APEGA Permit Deputy Officer
Title

VER	Date	Revision Summary	Author	Checked	Approved
03	2023-11-29	Complete restructure for improved clarity and flow, aligning industry standards. Refer to revision notes for details	Nahada Harris/ Carla Wong	Carla Wong	Daryle Tilroe
02	2022-02-11	Updates from Practice Review and for Document Authentication, Validation, & Control	Daryle Tilroe	David Clarke	Nicole Wolfe
01	2021-04-16	Original Issue	David Clarke	Daryle Tilroe	Nicole Wolfe

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Applicability

This *Standard Operating Procedure* (*SOP*) is applicable to all individuals involved with *Professional Engineering and Geoscience* (*PEG*) work conducted by and for the *City of Edmonton* (*City*). This includes all *City* employees (full-time, part-time, and temporary employees), contract staff whose work constitutes the *practice of engineering or geoscience*, and staff who support *PEG* work.

Synopsis

This *SOP* describes the *Quality Management System* (*QMS*) for the *PEG* work conducted by and for the *City*. It outlines the procedures that guide the *City's* commitment to quality, *continuous improvement*, and its focus on meeting regulatory and client (citizens, business partners, and stakeholders) requirements. The engineering and geoscience *QMS* aims to meet or exceed requirements and recommended best practices outlined in the *Engineering and Geoscience Professions (EGP) Act*, the *General Regulation,* and applicable *APEGA* practice standards, bulletins, and guidelines.

The requirements presented herein are minimum requirements. All individuals involved with *PEG* work at the *City*, including those who provide support to the professional practice, must adhere to the requirements of this *QMS*. These requirements supplement those in the *City's Professional Practice Management Plan* (*PPMP*). Readers are expected to be fully familiar with the *City's* "COE-PEG-SOP-0001 Professional Practice Management Plan."

Revision Notes

The document has undergone a complete restructure for improved clarity and flow, aligning it with industry standards. Major updates include:

- Senior Officer (SO) and Deputy Officer (DO) - formerly the Chief Operating Officer (COO) and the Deputy COO, is replaced throughout the document.
- Rearranged existing content to align with the new structure (also modified for brevity and clarity):
    - New section 5 added, 'Quality Standard and Objectives' which replaces sub-section 6.1 'Quality Directive'
    - Former section 6 'Leadership' moved to new section 7 renamed 'QMS Development and Governance'
    - Former section 7 'Resource' moved to new section 8 renamed 'Resource Management'
    - Removed former section 8 'Process and Procedures'; moved former sub-section 8.2 'Document Scope' to new subsection 9.1 and renamed to 'Document Applicability'
    - Former section 10 'Quality Control' moved to new subsection 9.5 and was renamed 'Document Control'
    - Former section 11 'Document Authorization, Control, and Authentication & Validation' moved to new subsection 9.3 and renamed to 'Document Authorization, Authentication, and Validation'

  - Former section 12 'Document Management' moved to new section 9 and renamed 'Document Management and Control' with content moved across the subsections
  - Rearranged former sections 9 'Date & Time', 14 'Field Reviews, Instructions, and Management of Change', 17 'Performance Evaluations of the Quality Management System' and 18 'Continual Improvement' to align with the document flow. Some subsection titles are also modified to suit the document flow
  - Former section 13 'Outsourcing of Engineering/Geoscience work' moved to new section 12 and renamed 'Procurement Process for PEG Services'
  - Former sections 15 'Software Verification' and 16 'Equipment Modifications & Repair' consolidated to new section 13 and renamed 'Verification and Modification of Software, Equipment, and Tools'
  - Former subsection 17.3 'Client Feedback' contents moved to new subsections 14.2 named 'Client Focus'
  - New section 14 added - 'Regulatory and Client Relations'
  - New section 16 added - 'Risk Management'
  - New section 18 added- 'Emergency Preparedness and Business Continuity'
- Applicability - Changes included adding employee staff types & removing reference to "external consultants" as this SOP applies to our PEG work (and we apply it to external consultants, but it's not for them to use it).
- Synopsis - Changes include addition of City's commitment to align with the Quality Standard, regulatory and client focus, General Regulation, APEGA bulletins & Guidelines, and removing some content that is repeated elsewhere in the document.
- Section 1 - Admin changes for clarity and flow. Expanded on clients (based on quality standard). Replaced 'quality policy' with the "City Standard - Professional Engineering & Geoscience Quality Management system.
- Section 2 - Clarified Quality Management System with respect to this document pertains to the practice of engineering and geoscience at the City.
- Section 3 - Removed version dates from reference documents. New added references:
  - COE-PEG-SOP-0010 PEG Internal Practice Reviews
  - COE-PEG-SOP-0011 Non-Conformance Process
  - COE-PEG-WI-0009 Onboarding & Offboarding APEGA Members
  - APEGA Guideline for Field Reviews of Engineering and Geoscience Work
  - The City Administrative Directive - Enterprise Risk Management and Procedure
  - City Standard - Professional Engineering & Geoscience Quality Management system
  - The City of Edmonton - Procurement Standard
- Section 4 - New/Modified Definitions:
  - Continuous Improvement: rather than used ISO's definition, tailored to PEG practice and removed "audit"
  - Digital Signature - modified definition and removed requirements; added the requirements to Section 9.3
  - Removed "Leadership" as a definition word
  - Non Conformance Report - edited with little change to context (removed word 'audit')

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  - PEG Document Administrator changed to QMS Administration; document management responsibilities were removed and moved to document COE-PEG-SOP-0004 definition for 'DMS Administration.'
  - PEG Quality Council: Administrative edits only
  - Performance Evaluation: Removed as a definition word
  - Professional Practice Leader: New definition
  - Process (removed as definition word)
  - Quality Assurance (new definition)
  - Quality (removed as definition word)
  - Quality Control: administrative edits only
  - QMS Administration (new definition)
  - Wet Signature - edited and removed requirements; added some requirements to Section 9.3
- Section 5 - New section added - Quality Standard and Objectives
- Section 6 - New/Modified Roles and responsibilities:
  - Auditors Removed, replaced with 'Internal Practice Review Panel'
  - Edited roles for: COO (Senior Officer), Deputy CO (Deputy Senior Officer), Director, PEG Quality Manager, Project Managers, RMs, Subject Matter Experts to relate specifically to QMS
  - Added roles for: LPs, M.I.T.s, PEG Practice Office, PEQQC, PPL, QMS Administration, Supervisor, Technical Supervisor
- Section 7 - former section 6 titled 'Leadership' renamed to 'QMS Development and Governance.' Modified for brevity and clarity.
  - New subsection addition 7.1 'PEG Practice Office'
  - Subsection 7.2 - added 'at least' to two additional RMs, changed 'The PEGQC shall meet annually' to 'The PEGQC must meet at least once annually'. Under review items - addition of QMS annual plan and its progress, and internal practice reviews, changed client feedback to 'Regulatory and client feedback' and RM feedback to 'RM meetings'
- Section 8 - Former section 7 titled 'Resource' renamed to 'Resource Management.' Modified for brevity and clarity.
  - New subsection addition 8.2 'Resources for Work Environment'
  - Subsection 8.3 (former 7.3) - 'Engineering Job Evaluation Committee (EJEC)' name changed to 'PEG Job Evaluation Committee (PEGJEC)'
  - Subsection 8.4 (former 7.4) - added 'Ideally, when creating training plans, technical supervisors should be involved, along with performance supervisors' and reference to 'COE-PEG-WI-0009 Onboarding & Offboarding APEGA Members'
  - Subsection 8.5 (former 7.5) - consolidated supervision activities and specific activities.
  - Subsection 8.6 (former 7.6) - updated SMEs are available to 'anyone' from 'any LP' who requires assistance
- Section 9 - new section title 'Document Management and Control'; complete restructure and modified for improved clarity and flow.
- Section 10 - former section 14 modified for brevity and clarity, added reference to 'APEGA Guideline for Field Reviews of Engineering and Geoscience Work.'

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- Section 11 - former section 9; Removed hybrid ISO 8601 date application format with the month as three letter, capitalized, alphabetic abbreviation (displayed in conjunction with an authentication or validation visual representation) from acceptable application alternatives list.
- Section 12 - former section 13 titled 'Outsourcing of Engineering/Geoscience Work', complete restructure and modified for improved clarity and flow, added reference to City's Procurement Standard and 'APEGA Guideline for Selecting Engineering and Geoscience Consultants'.
- Section 13 - former sections 15 'Software Verification' and 16 'Equipment Modifications & Repair' consolidated to new subsection 13 and renamed, modified for brevity and clarity, added requirements for equipment verification calibration.
- Section 14 - new section 'Regulatory and Client Relations.' Content relocated from former 17.3 'client feedback'
- Section 15 - former section 17 'Performance Evaluations of the Quality Management System', reorganized and modified for improved clarity and flow, removed subsection 'Purpose' (former subsection 17.1).
    - Subsection 15.1 (former subsection 17.2 'Internal Auditing' renamed to 'Internal Practice Review)' - added reference to 'COE-PEG-SOP-0010 PEG Internal Practice Review Process' and internal practice review panel
    - Subsection 15.2 (former subsection 17.3 'Client Feedback' renamed to 'Feedback') - most of the content is moved to sub-section 14.2 'Client Focus'
    - Subsection 15.3 (former subsection 17.4) - modified for clarity, modified requirement '...lessons learned sessions should be conducted with team members and key stakeholders at least semi-annually' to 'regularly', addition of 'Each Section must retain results and, at the discretion of the RM, share them with the PPL, who may escalate them to the PEGQC for review and necessary action'
    - Subsection 15.4 (former subsection 17.6 'Non-Conformance Investigations') - new content, this is covered in 'COE-PEG-SOP-0011 Non-Conformance Process'
    - Subsection 15.5 - former subsection 17.5 'Non-Conformance Reports', modified to align with the requirements in the new SOP 'COE-PEG-SOP-0011 Non-Conformance Process'
- Section 16 - new section 'Risk Management'
- Section 17- former section 18 'Continual Improvement', reorganized and modified for improved clarity and flow, removed subsection 'Purpose' (former subsection 18.1).
    - Subsection 17.1 - former subsection 17.1 'Review and Updates' modified to account for the Quality Standard and the PEG practice QMS documents
    - New subsection 17.3 'PEG Practice Reviews'
- Section 18 - new section 'Emergency Preparedness and Business Continuity.'

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1. Purpose

The purpose of the *Quality Management System* (*QMS*) is to establish an effective framework that ensures the *Professional Engineering and Geoscience* (*PEG*) work conducted by and for the *City of Edmonton* (*City*) meets or exceeds regulatory and client requirements. Clients may be either internal or external and include business partners, stakeholders, and citizens. *PEG* work includes the development, issuance, and management of *technical documents* (including *Professional Work Products* (*PWPs*) and *QMS documents* that support *PEG* work), *outsourcing* of *PEG* services, and any other work related to *PEG* practice.

This purpose is achieved through the establishment and communication of the "City Standard - Professional Engineering & Geoscience Quality Management system," the quality objectives defined therein, and the *PEG* practice *Standard Operating Procedures* (*SOPs*) that together provide the necessary *Quality Assurance* oversight to the *practice of engineering and geoscience* within the *City*.

2. Scope

This *SOP* applies to all *PEG* activities conducted by or for the *City* and outlines the processes and procedures that must be followed to ensure quality, operational efficiency, *continuous improvement,* and compliance to regulatory requirements. In this document, when referring to the *QMS*, it pertains specifically to the *practice of engineering and geoscience* at the *City*.

3. References

- The Engineering and Geoscience Professions Act of Alberta
- The Engineering and Geoscience Professions General Regulation
- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0003 Developing and Issuing Standard Operating Procedures, Work Instructions, and Related Documents for Engineering & Geoscience
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering & Geoscience Software
- COE-PEG-SOP-0008 Record Documents and Redlines
- COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements
- COE-PEG-SOP-0010 PEG Internal Practice Reviews

- COE-PEG-SOP-0011 Non-Conformance Process
- COE-PEG-TMPL-0006 Engineering & Geoscience Outsourcing Plan Template
- COE-PEG-WI-0009 Onboarding & Offboarding APEGA Members
- APEGA Continuing Professional Development Program (CPD)
- APEGA Guideline for Selecting Engineering and Geoscience Consultants
- APEGA Professional Practice Standard for Authenticating Professional Work Products
- APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience
- APEGA Guideline for Professional Engineers Providing Equipment Certification as Required by Alberta's Occupational Health and Safety Code
- APEGA Guideline for Field Reviews of Engineering and Geoscience Work
- City Policy A1120A - Employee Learning and Development
- The City Administrative Directive - Enterprise Risk Management and Procedure
- City Standard - Professional Engineering & Geoscience Quality Management system
- The City of Edmonton - Procurement Standard
- Project Management Reference Guide (PMRG) Webpage

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in the "COE-PEG-SOP-0001 Professional Practice Management Plan," or other *QMS* documents, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained.

4.1. Continu(al/ous) Improvement

The process of ongoing improvement to the existing *Quality Management System* processes*, professional services,* and outputs to ensure that the engineering and geoscience work carried out by and for the *City* meets all regulatory requirements and maintains the highest professional quality. Process improvement opportunities are identified through *internal practice reviews,* regulatory practice reviews, review findings and conclusions, analysis of data, management reviews, feedback from internal and external sources, or other means.

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4.2. Digital(ly) Signature (or Signing or Signed)

A certification indicating the approved status and authority of an electronic document as an unaltered original. *Digital Signatures* include visual representations of the personal signature and/or a personal or *Permit to Practice* stamp images obtained from *APEGA.* The *digital signature* certificate is provided by a Certificate Authority authorized by *APEGA*.

4.3. Digitally Signed Original (DSO)

An electronic file or other digital artifact that has been *digitally signed* and has the characteristic of losing digital certification, or explicitly identifying past signed versions, when altered, combined, or extracted in any way. It has the same authority and document management requirements as a paper or other physical original.

4.4. ISO 8601

International short date and time standard designed by the International Organization for Standardization (ISO) and broadly adopted to eliminate inconsistencies and ambiguities in date and time formats, while also being language independent. Refer to this Summary, Government of Alberta, and Government of Canada complementary standards.

4.5. Non-Conformance Report (NCR)

A report which documents the details of a deviation from the requirements of the *Quality Management System* (i.e., *non-conformance*). The report provides a clear and concise description of the deviation and the associated details so that *corrective action(s)* can be initiated.

4.6. PEG Quality Council (PEGQC)

A group who monitors and governs the *Quality Management system* (*QMS*) and represents and sponsors the *Quality Management System* before senior *City* leadership.

4.7. PEG Quality Manager

A *Licensed Professional* responsible for the implementation and oversight of the *Quality Management System* and associated document management.

4.8. Professional Practice Leader (PPL)

A *Responsible Member* appointed by the *Senior Officer* to provide support, guidance, and direction to *City* employees in the *practice of engineering or geoscience*. Typically, the *Professional Practice Leader* will be a senior member of the management team.

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4.9. Quality Assurance (QA)

The systematic efforts taken or a set of activities within the *Quality Management System* that help ensure or provide confidence that the quality requirements will be fulfilled.

4.10. Quality Control (QC)

A component of the *Quality Management System* that focuses on meeting quality requirements, with specific emphasis on inspection or review aspects within the overall framework of *Quality Assurance* activities.

4.11. Quality Management System (QMS) Administration

Individuals or groups identified to maintain the *PEG Quality Management System* under the direction of the *PEG Quality Manager*.

4.12. Wet Signature (or Signing or Signed)

The classic, physical application of a handwritten signature, in permanent ink, to a hardcopy of a document to certify its approval, status, and authority as an unaltered original. *Wet Signatures* are applied onto the appropriate visual representation graphic of a personal or *Permit to Practice* stamp obtained from *APEGA*.

5. Quality Standard and Objectives

5.1. Quality Standard

The *City* is committed to ensuring that the engineering and geoscience work carried out by and for the *City* meets all regulatory requirements, is of the highest quality, and follows a comprehensive *QMS*. This is achieved through the establishment and execution of the "City Standard - Professional Engineering & Geoscience Quality Management system" and the quality objectives defined therein.

5.2. Management Commitment to Quality

The *City* recognizes the contribution of the engineering and geoscience professions in fulfilling its cultural commitment to excellence. Senior leadership at the *City* is committed to establishing, implementing, and *continually improving* the *QMS* to ensure consistent compliance with all regulatory requirements. This commitment is centered around a client-focused approach, with the aim of meeting or exceeding citizen, business partner, and stakeholder requirements.

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6. Roles and Responsibilities

The following sections outline the roles and responsibilities associated with the successful implementation, maintenance, and *continual improvement* of the *QMS*:

6.1. Deputy Officer (DO)

Supports the *Senior Officer (SO)* in fulfilling *QMS*-related responsibilities as required by the *QMS.*

6.2. Directors

Accountable for ensuring that *PEG* work conducted within their Section aligns with the requirements of the *City's Professional Practice Management Plan* (*PPMP*), this document, and the *PEG* practice *SOP*s applicable to the overall practice. Directors collaborate with *Responsible Members* (*RMs*) and provide support to the staff in their Section to ensure compliance with regulatory requirements and the *City's* QMS Standard. Additionally, directors support supervisors in resource management, ensuring employees have the necessary tools and resources for competent job performance.

6.3. Internal Practice Review Panel

Conducts *internal practice reviews* of selected *City* Sections to verify adherence to the *QMS*. The review panel follows a systematic, independent, and documented process to gather objective evidence and assess compliance with the requirements of the *QMS*.

6.4. Licenced Professionals (LPs)

Responsible for executing their work in alignment with the *City's PPMP,* this document, and *PEG* practice *SOPs* applicable to the overall practice. *Licensed Professionals (LPs)* must ensure that their work meets or exceeds regulatory requirements and the *City's QMS* standard. Additional responsibilities of *LPs* are defined by *APEGA* and outlined in the *PPMP*.

6.5. Members-in-Training (M.I.T.s)

Under the direct supervision of *LPs*, responsible for carrying out their work in accordance with the *City's PPMP*, this document, and *PEG* practice *SOPs* applicable to the overall practice. *Members-in-Training* (*M.I.T.s*) must ensure that their work meets or exceeds regulatory requirements and the *City's QMS* standard. Additional responsibilities of *M.I.T.s* are defined by *APEGA* and outlined in the *PPMP*.

6.6. PEG Practice Office

Provides support and oversight to the *practice of engineering and geoscience* within the *City* and has the overall responsibility for the development, implementation, and ongoing maintenance of the *QMS*.

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Responsibilities of the *Practice Office* include:

- acting as a liaison between *APEGA* and the *City*
- ensuring the *City* meets its *PEG* regulatory requirements
- developing and implementing the annual *QMS* strategic plan
- developing and maintaining the procedures that outline the requirements applicable to corporate-wide *PEG* practice
- developing and adhering to the annual *internal practice review* plan
- conducting and delivering quarterly *RM* meetings
- ensuring the submission of *QMS* reports to the *PEG Quality Council* (*PEGQC*)
- supporting *RMs*, *LPs*, *M.I.T.s*, and others contributing to *PEG* practice by conducting training sessions, creating templates, and offering assistance in meeting their professional responsibilities
- ensuring the *continual improvement* of the *QMS* and associated processes and procedures to maintain their effectiveness, adequacy, and relevance
- actively managing documents, standards, and technical resources, especially those with wide-ranging applicability across the *City*, when deemed appropriate

6.7. PEG Quality Council (PEGQC)

Responsible for ensuring that senior *City* leadership conducts regular planned reviews of the *QMS* to ensure its continued suitability, adequacy, effectiveness, and alignment with the strategic direction of the *City.*

6.8. PEG Quality Manager

Responsible for the development, implementation, ongoing maintenance, and oversight of the *QMS*.

6.9. Professional Practice Leader (PPL)

Responsible for overseeing the *PEG Practice Office* and for providing professional expertise, direction, and guidance in the development, implementation, and ongoing maintenance of the *City's QMS*.

6.10. Project Managers

Responsible for providing an appropriate environment and support to the *LPs* on the project team to ensure *QMS* requirements are met. In addition, project managers are responsible for:

- ensuring project-related *technical documents* are submitted to the appropriate *Document Management System* in compliance with the requirements outlined in *SOP* "COE-PEG-SOP-0004 Engineering & Geoscience Document Management"
- procuring quality engineering and geoscience *professional services* and *PWPs* when *outsourcing PEG* services

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- ensuring compliance with the requirements outlined in *SOP* "COE-PEG-SOP-0009 Engineering and Geoscience Outsourcing Requirements" when *outsourcing PEG* services
- ensuring *PWP* deliverables submitted to the *City* by external consultants or produced by the *City* comply with the *authentication* requirements outlined in *SOP* "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products"
- ensuring that any *consequential change(s)* made to a *PWP* deliverable, whether submitted by external consultants or produced by the *City*, complies with the requirements outlined in *SOP* "COE-PEG-SOP-0008 Record Documents and Redlines"

6.11. Quality Management System Administration

Under the supervision of the *PEG Quality Manager,* provides support to the *PEG Practice Office* in carrying out its responsibilities.

6.12. Responsible Members (RMs)

Responsible for providing oversight of the *practice of engineering* or *geoscience* within their area of influence. *RMs* are the first point of contact for any questions regarding regulatory requirements. Additional responsibilities of *RM*s are defined by *APEGA* and outlined in the *PPMP*.

6.13. Senior Officer (SO)

Accountable for the implementation of, adherence to, and the *continuous improvement* of the *City's QMS.*

6.14. Subject Matter Experts (SMEs)

Actively support *LPs* in ensuring the technical quality of *PEG* work and associated *PWPs.*

6.15. Supervisors

Responsible for overseeing *City* employees engaged in the *practices of engineering and geoscience*, as well as those who support *PEG* work at the *City*. Responsibilities include identifying resource requirements and ensuring the *City* is staffed with qualified personnel to carry out and support *PEG* work.

6.16. Technical Supervisors

Responsible for directly supervising *Members-in-Training, LPs,* or other contributors involved in the *practice of engineering or geoscience,* and ensuring their compliance with the *Quality Management System*.

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7. QMS Development and Governance

7.1. PEG Practice Office

Under the leadership of the *SO*, the *Practice Office* has overall responsibility for implementing, adhering to, and *continuously improving* the *QMS*. The *Practice Office* comprises the following members:

- *Senior Officer*
- *Deputy Officer*
- *Professional Practice Leader*
- *PEG Quality Manager*
- *Responsible Members*
- *QMS Administration*

The members of the *Practice Office*, in effectively carrying out their individual responsibilities, play a major role in the development and governance of the *City's QMS*.

7.2. PEG Quality Council (PEGQC)

The *PEGQC* comprises the following members:

- *Senior Officer*
- *Deputy Officer*
- *Professional Practice Leader*
- *PEG Quality Manager*
- at least two additional *RMs* (may be a rotating assignment)

The purpose of the *PEGQC* is to ensure that senior *City* leadership regularly reviews the *QMS* for its ongoing suitability, adequacy, effectiveness, and alignment with the strategic direction of the *City*.

The *PEGQC* must meet at least once annually, or more frequently as required, to review the following:

- *QMS* annual plan and its progress
- Regulatory and client feedback
- *RM* meetings
- *Internal practice reviews*
- *Non-Conformance Reports* (*NCRs*)
- *Continual improvement* initiatives
- any other business necessary to ensure the *QMS* is functioning properly and issues are being addressed

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7.3. Responsible Members (RMs)

*RM*s are assigned by the *SO* and typically hold leadership roles in the organization, directly influencing the quality of engineering and geoscience work. The selection of *RM*s must be designed to ensure adequate coverage throughout the various *City* Sections containing *LPs* and *M.I.T.s*. The *APEGA* recommended ratio of one RM to ten *LPs*, *M.I.T.s*, and other individuals contributing to the *practice of engineering or geoscience*, for appropriate professional oversight, should be adhered to as closely as reasonably practicable.

*RM*s are required to meet at least quarterly to discuss common issues, with the *QMS* being a standard agenda item.

7.4. Communication and Awareness

A communication plan must be developed to ensure all *LPs, M.I.T.s,* and support staff are aware of the requirements of the *QMS* and associated procedures, specifically including:

- the QMS Standard and the quality objectives therein
- the "COE-PEG-SOP-0001 Professional Practice Management Plan"
- their respective responsibilities
- the implications of *non-conformance*

Awareness is developed via various communication methods including meetings, email lists, webpages, and other collaborative tools.

8. Resource Management

Supervisors, in consultation with *RM*s, must ensure that knowledgeable and qualified staff are available to meet regulatory and client requirements.

This involves the key activities identified in this sections below:

8.1. Identification of Resource Requirements

Supervisors must identify resource requirements and conduct regular reviews. This process is integrated into the standard budgeting procedures within the *City* and involves all levels of management.

8.2. Resources for Work Environment

Directors and supervisors must collaborate to provide employees with the essential tools and resources needed for competent job performance. This includes providing access to the requisite information and essential software applications. Additionally, it involves ensuring hardware access, including computer resources, and providing access to a suitable physical work environment.

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8.3. Hiring Process

Refer to the "COE-PEG-SOP-0001 Professional Practice Management Plan" for a description of the hiring process.

Directors and supervisors must work collaboratively with the Corporate Recruitment team to ensure that vacancies are filled as expeditiously as possible.

Supervisors must ensure that job descriptions clearly outline not only the tasks but also the competency requirements. Job descriptions must undergo reviews as required by the *City's PEG Job Evaluation Committee* (*PEGJEC*).

8.4. Learning and Development

As described in the *PPMP,* each *LP* and *M.I.T.* will develop an individual training plan in conjunction with their supervisor as part of their Personal Contribution Plan. Individual training plans must comply with any existing departmental learning and development directives and frameworks required by "City Policy A1120A - Employee Learning and Development." Ideally, when creating training plans, *technical supervisors* should be involved, along with performance supervisors.

The development of the training plan must consider the following:

- skills and competencies required, both presently and in the near future
- current skills and competencies available
- available budget

Furthermore, *LPs* must ensure they meet or exceed *APEGA* requirements for *Continual Professional Development* (*CPD*). *RM*s must also ensure that *LPs* and *M.I.T.s* they oversee complete the applicable training, assessments, and other requirements provided in the *Work Instruction* (*WI*) "COE-PEG-WI-0009 Onboarding & Offboarding APEGA Members." This is in addition to any Section or position-specific training.

The *City*'s Learning Management System (LMS) is used to track corporate training. A record of technical training completed by each *LP* and *M.I.T.* should also be recorded in LMS. LMS records can be used to supplement individual tracking of *CPD* hours.

8.5. Supervision and Mentoring

Adequate supervision of employees must be provided at all times. This is especially critical for *M.I.T.s*. *APEGA* requires *M.I.T.s* be under the direct supervision of *LPs* who take professional responsibility for their engineering or geoscience work.

Technical supervisors have a duty to foster an understanding of professionalism and technical expertise. The *technical supervisor* must take an active leadership role, which includes:

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- assigning progressively more responsible work to build experience and knowledge
- involving staff in a range of work activities, including on-site exploration, monitoring, investigation, engineering or geoscience assessment, or construction project management to acquire a breadth of experience before being assigned more responsible roles
- supporting participation in professional development activities
- fostering an understanding of their colleagues' roles and responsibilities
- providing ongoing review and feedback on work assignments and reports to foster professional development of staff
- conducting mentoring sessions to discuss policies, procedures, corporate history, project details, additional training opportunities
- discussing the assigned work and workload of *LPs* at supervisory meetings
- engaging staff in liaison roles during general meetings with technical teams from other work groups

8.6. Subject Matter Experts (SMEs)

The *City* has many Subject Matter Experts (SMEs) who are experts in their field. SMEs are available to anyone who requires assistance.

9. Document Management and Control

9.1. Document Applicability

Document applicability is categorized into two tiers:

Tier 1: Corporate Wide Applicability - These documents outline common requirements that are applicable to the overall *PEG* practice at the *City*.

Tier 2: Group Specific Applicability - These documents specify requirements that apply to *PEG* practice within a specific group, typically under the oversight of an *RM*. The focus is often at a Section level or based on asset type, though variations may occur.

9.2. Document Management Requirements

The *City* requires a standardized approach to the management of all *technical documents*, including *PWPs* and *QMS documents*. "COE-PEG-SOP-0004 Engineering & Geoscience Document Management" describes the minimum requirements for controlling, retaining, and accessing *technical documents* that support or are derived from the engineering and geoscience work conducted by and for the *City.*

The *City's PPMP*, this *QMS SOP*, and the *PEG* practice *SOP*s, *WIs*, and other related operational documents applicable to overall *PEG* practice corporate-wide (i.e., Tier 1

documents) are accessible through the *Electronic Document Management System* called CoE-TriDocs.

The development, distribution, and *continual improvement* of *QMS documents* such as *SOPs*, *WIs*, forms, templates etc., must follow the requirements of "COE-PEG-SOP-0003 Developing and Issuing Standard Operating Procedures, Work Instructions, and Related Documents for Engineering & Geoscience" and "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

9.3. Document Authorization, Authentication, and Validation

Clear indication of a document's authorization status and authority as an original are critical to the *QMS* and *PEG* practice. Document authorization of *PEG QMS documents* must adhere to the requirements outlined in "COE-PEG-SOP-0003 Developing and Issuing Standard Operating Procedures, Work Instructions, and Related Documents for Engineering & Geoscience."

An understanding and the correct application of *wet* and *digital signatures* is required. *PWPs* must be *authenticated* and *validated* in accordance with the "APEGA Professional Practice Standard for Authenticating Professional Work Products" and the requirements outlined in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products."

Note, *digital signatures* cannot be combined with a scan of a previously applied *wet signature* if the validity of the *wet signature* needs to be maintained. Likewise, a *wet signature* cannot be combined with a printed copy of a previously *digitally signed* document if the validity of the *digital signature* needs to be maintained.

9.4. Management of Document Changes

When revising or making changes to *technical documents*, including *PWPs*, requirements outlined in "COE-PEG-SOP-0004 Engineering & Geoscience Document Management" must be met. The management of changes made is critical to maintain the integrity of these documents for their intended purpose. Requirements for *authentication* and *validation* of any *consequential change(s)* made to a *PWP* are included in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" and are in accordance with the "APEGA Professional Practice Standard for Authenticating Professional Work Products."

9.5. Document Control

Control over documented information is required by the *QMS* to ensure that *technical documents* are adequately protected, available, and suitable for use to support the operation of processes, thereby ensuring quality of the *PEG* work. Minimum

requirements for document control are described in "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

Quality Control is a fundamental element of the *QMS,* defining how *PWPs* are checked and verified as correct and complete. A minimum requirement for *Quality Control* applicable to all *PWP*s can be stated as:

"Nothing goes out without being checked"

Additional requirements for *PWP Quality Control* can be found in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products."

10. Field Reviews, Instructions, and Management of Change

The management of field reviews and *consequential changes* made during the construction or implementation of *PWPs* is critical to maintain the integrity of *PWPs* prepared for their intended purpose. Requirements for *authentication* and *validation* of these *PWPs* are outlined in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products." Additional requirements, specific to *record drawings*, *redlines,* and *Field Change Notices* can be found in "COE-PEG-SOP-0008 Record Documents and Redlines." The "APEGA Guideline for Field Reviews of Engineering and Geoscience Work" provides recommendations for planning and conducting field reviews.

11. Date(s) and Time(s)

Clear, consistent, and unambiguous representation of dates and times is critical in *PEG* practice, impacting aspects such as safety, quality, *authentication, validation*, and document management.

In the *QMS* and throughout the *practices of engineering and geoscience*, two acceptable and time representations are recognized:

- *ISO 8601* compliant dates and times (e.g., 2022-03-23, 17:50, or 2022-03-23T17:50) [preferred]
- formal, long format dates (e.g., 4:50 PM on March 23, 2022)

12. Procurement Process for PEG Services

12.1. Procurement Standard

The *City* is bound by provincial and federal trade agreements which outline requirements for how the *City* is to procure goods, services, and construction. "The City of Edmonton - Procurement Standard" describes the minimum requirements for procuring goods, services, construction, or intellectual property rights on behalf of the

City. In addition, the requirements outlined in Section 12.2 must be followed when procuring *PEG* services.

12.2. Outsourcing PEG Services

Outsourcing PEG services is done routinely and must be performed in accordance with the "APEGA Practice Standard for Relying on Work by Others and Outsourcing of Engineering and Geoscience," and must comply with the process and requirements in "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements." The "APEGA Guideline for Selecting Engineering and Geoscience Consultants" provides additional recommendations for evaluating and selecting engineering or geoscience consultants.

13. Verification and Modification of Software, Equipment, and Tools

13.1. Software Verification

"COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering & Geoscience Software" has been developed to ensure that software used in the preparation of engineering or geoscience *PWP*s is complete and accurate when applied as designed, ensuring compliance with *APEGA* regulatory requirements. The *SOP* provides a procedure to determine if the software is classified as a *digital PWP* as defined by *APEGA* and outlines requirements for *verification* and *authentication*.

13.2. Equipment Verification

Measurement and test equipment utilized in *PEG* work must be suitable and aligned with the specific activity requirements. If applicable, equipment must have a valid and traceable calibration certificate, and its operation must adhere to the prescribed calibration due date. The *RM* or their designated appointee within the respective Section is responsible for overseeing the safe and appropriate utilization of equipment. To ensure ongoing functionality, accuracy, and the promotion of a safe work environment, maintenance plans or procedures must be implemented according to established protocols and schedules.

13.3. Software and Equipment Modification

In cases where equipment, tools, or software undergo design modification, customization, repair, or are used differently than the manufacturer's or designer's original intent, an *LP* must conduct a safety assessment for the intended use. If deemed safe, the *LP* is then responsible for ensuring that the *consequential change* is properly *authenticated* and *validated*.

The "APEGA Guideline for Professional Engineers Providing Equipment Certification as Required by Alberta's Occupational Health and Safety Code" provides additional insight into the obligations engineers have when inspecting and certifying equipment, particularly when deviating from manufacturer's specifications. The guideline addresses scenarios where compliance with manufacturer's specifications is impractical, and

employers may seek a professional engineer's certified specification to ensure equipment safety and compliance with workplace health and safety standards.

14. Regulatory and Client Relations

14.1. Regulatory Focus

Formal external communications pertaining to regulatory requirements, such as communications to or from *APEGA*, must be documented by the *Practice Office*. Any duly served regulatory communications from *APEGA* to the *City* that contemplate a reply must be responded to, promptly and appropriately, within the timeline given. Records of such communication must be retained indefinitely. The destruction of such records must only be carried out with the approval of the *SO*. Regulatory communication records contain the following information, as applicable.

- description
- details of the action(s) taken
- name of personnel responsible/accountable
- estimated completion date for the action(s) taken
- status: open or closed

These communications must be shared with the respective team, relevant *RM*, *SO*, *DO,* and *PEGQC* for review and actions, where appropriate. Regulatory communication records and corresponding actions taken will serve as a resource for facilitating *continuous improvements*.

14.2. Client Focus

One of the *City's PEG QMS quality* objectives is to be business partner, stakeholder, and citizen focused. This implies that each Section within the *City* must identify the requirements of their clients. Clients of any Section may be either internal or external and include business partners, stakeholders, and citizens. If applicable to a Section, they must establish a methodology for obtaining, monitoring, and addressing client feedback. This may be done in conjunction with how various departments are currently obtaining feedback. Feedback also includes outputs from the *PEGQC*. Options to be considered include:

- surveys
- random client in person interviews
- meetings (including town halls)

If a Section receives client feedback in the form of a complaint, it must be promptly addressed, and the progress of actions taken to resolve the complaint must be recorded. Relevant feedback must be communicated to the respective team's *RM*. When necessary, the *RM* will escalate the feedback to the *PPL* for their input. At the discretion of the *PPL*, the feedback may be further escalated to the *SO*, *DO,* and *PEGQC* for review

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and action. The feedback records will serve as a valuable resource to drive *continuous improvements* within the Section and across the corporation, as applicable.

15. Performance Evaluation of the Quality Management System

The *QMS* must be continually evaluated to measure its efficacy. Details regarding forms of performance evaluations are outlined in the following sections.

15.1. Internal Practice Review

An *internal practice review* process verifies compliance with the *QMS* and its associated procedures. *Internal practice reviews* must be performed in accordance with the "COE-PEG-SOP-0010 PEG Internal Practice Review Process" and are conducted by the review panel established by the *Practice Office*. The process establishes the following:

- frequency and schedule of reviews to be performed
- review topics
- review methodology
- resource requirements

Findings from *internal practice reviews* must be communicated to the reviewed team, the appropriate *RM* for review and action, as well as to the *SO*, *DO,* and *PEGQC* for information.

15.2. Feedback

The primary objective of the *QMS* is to ensure that the *PEG* practice at the *City* meets regulatory and client requirements. Feedback is a means of measuring how well those requirements are being met. As applicable, feedback records must comply with the requirements in Section 14 of this document and will serve as a resource for driving *continuous improvements* within the Section and corporation.

15.3. Lessons Learned

Lessons learned is a formalized process designed to review project execution, either during or after completion, or for non-project teams at regular intervals. The primary purpose is to capture insights or ideas on how to improve in future performance.

Lessons learned sessions for all capital projects using the Project Develop and Delivery Model (PDDM), must be conducted, as outlined on the "Project Management Reference Guide (PMRG) Webpage."

For Sections not involved in capital infrastructure projects, or those not following PDDM, lessons learned sessions should be conducted with team members and key stakeholders regularly.

Results of the lessons learned sessions must be summarized and communicated to the respective team. Each Section must retain results and, at the discretion of the *RM*, share them with the *PPL*, who may escalate them to the *PEGQC* for review and necessary action.

15.4. Non-Conformance Investigations

When initiated, *non-conformance* investigations are handled on a case-by-case basis as described in "COE-PEG-SOP-0011 Non-Conformance Process."

15.5. Non-Conformance Reports (NCRs)

Non-conformances can be raised by anyone who is aware of a deficiency or incident where the *QMS* or associated processes are not being followed and are summarized in *NCRs*. The process for handling *non-conformances*, including identification, evaluation, classification, documentation, reporting, and resolution is outlined in "COE-PEG-SOP-0011 Non-Conformance Process." Any *non-conformance* that has been detected and confirmed as valid must be summarized in a *NCR* and communicated to the respective team, as described in "COE-PEG-SOP-0011 Non-Conformance Process."

16. Risk Management

Corporate risk management at the *City* is through a formal Enterprise Risk Management framework. "The City Administrative Directive - Enterprise Risk Management and Procedure" outlines the processes and procedures that must be followed by *City* employees to identify, assess, manage, mitigate, and report on enterprise risks.

For information on risk management within the context of project management, refer to "COE-PEG-SOP-0001 Professional Practice Management Plan."

17. Continual Improvement

To ensure ongoing effectiveness, adequacy, and relevance, the *QMS* and associated procedures must be subject to *continual improvement.*

17.1. Review and Updates

- "City Standard - Professional Engineering & Geoscience Quality Management system" must undergo a review at least once every three years to confirm its continued effectiveness and must be formally approved by the *City* Manager on the same three-year cycle
- "COE-PEG-SOP-0001 Professional Practice Management Plan" must undergo an annual review by the *Practice Office* to verify its continued suitability and effectiveness. The *PPMP* must be signed and dated at least annually by the *SO*

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and at least one *RM,* even if no updates are needed, as a reaffirmation of its continued relevance

- *PEG* practice *QMS documents* with corporate wide applicability, such as Tier 1 *SOPs, Work Instructions,* and other related documents, must undergo a review and update as defined in "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

17.2. PEG Quality Council (PEGQC) Review

The *PEGQC* are expected to meet on a regular basis to review the various reports resulting from the performance evaluation activities as described in Section 15. At least annually, the *PEGQC* must formally consider the results of these evaluations to determine if there are needs or opportunities that require action.

The *PEGQC*, *SO,* or *DO* must initiate *continual improvement* initiatives wherever warranted.

17.3. PEG Practice Reviews

The purpose of *PEG internal practice reviews* is to objectively and impartially evaluate process outputs, ensuring compliance with *QMS* requirements. The purpose of regulatory reviews is to assess the *City's practice of engineering and geoscience* against the "Engineering and Geoscience Professions Act", "General Regulation", and APEGA's practice standards, bulletins, and guidelines. Any identified *non-conformances* trigger *corrective action*(*s*). Additionally, practice reviews identify *Opportunities for Improvement*, providing recommendations to improve the internal processes under review or the *QMS* itself.

18. Emergency Preparedness and Business Continuity

Each Branch within the *City* maintains its individual emergency preparedness and business continuity plan, which is overseen by branch management and communicated as needed. The activation of business continuity measures can be initiated either by branch leadership or, at the corporate level, by the *City Manager* or the Deputy City Manager(s).

The Office of Emergency Management provides strategic policy direction and leadership to the *City's* Business Continuity Management Program. The program coordinates proactive pre-planning which helps *City* departments anticipate, prepare for, respond to, and recover from disruptions. It provides a roadmap for continuing operations under adverse conditions and during disruptions caused by all types of incidents, emergencies, and crises.

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Standard Operating Procedure

Engineering and Geoscience Document Management

Document #: COE-PEG-SOP-0004

Version: 02

Authorized By:

Nicole Wolfe	2023-08-24	
Name	*Date*	*Signature*

Acting Branch Manager, Building Great Neighbourhoods & APEGA Permit Deputy Officer
Title

VER	Date	Revision Summary	Author	Checked	Approved
02	2023-08-24	Revision following initial procedure implementation, including integrating process improvements and refined language for adherence to style guide. Refer to 'Revision Notes' for details.	Carla Wong/ Nahada Harris	Carla Wong	Daryle Tilroe
01	2022-01-24	Original Issue	Daryle Tilroe	David Clarke	Nicole Wolfe

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Applicability

This *Standard Operating Procedure* (*SOP)* is applicable to all individuals involved with *Professional Engineering and Geoscience* (*PEG*) work, particularly those involved with controlling and maintaining documents that support or are derived from the engineering and geoscience work conducted by and for the *City of Edmonton* (*City*).

Synopsis

This *SOP* establishes the minimum requirements for controlling and maintaining *technical documents* that support the *PEG* work conducted by and for the *City*. These documents are created by personnel employed by the *City* or submitted to the *City* by external consultants. *Technical documents* also include *Quality Management System documents*.

Revision Notes

Version 02 revision contains minor link updates, refined language for clarity and adherence to style guide. Major updates include:

- Document title revised; former title was 'Engineering & Geoscience Document Management Standard'.
- This document has been modified to more clearly include QMS documents in technical documents. This update is reflected throughout the document.
- Senior Officer (SO) - formerly the Chief Operating Officer (COO), is replaced throughout the document.
- Deputy Officer (DO) - formerly the Deputy COO, is replaced throughout the document.
- Section 1 - Modified for brevity and clarity.
- Section 2 - Modified for clarity. Addition of clarification of the word 'document' in the context of this SOP.
- Section 3 - Contains minor links and version updates/corrections. Addition/deletions include:
    - Additions - City Administrative Directive and Procedure A1410C, Corporate Records Management, OneCity Intranet.
    - Deletions - COE-PEG-SOP-0007, APEGA standard for Authenticating Professional Work Products.
- Section 4 - New/Modified Definitions:
    - Document Management System (DMS)
    - Electronic Document Management Systems (EDMS)
    - Project Document
    - Quality Management System (QMS) Document
    - Sustaining document; formerly referred to as Master document
    - Technical document
- Section 5 - Modified for brevity and clarity.
- Section 6 - Modified procedure to broaden sub-section titles.
- Section 6.1 - Removed statement - 'Technical document may be developed internally within a

DMS process.' Modified for clarity.

- Section 6.5 - Updated subsection Title; formerly this was 'Filing'. Addition of procedural requirements to preserve audit trails of past revisions and approvals.
- Section 6.6 - Addition of procedural requirement for accessing prior versions of a document.
- Section 6.7 - Addition of procedural requirement for accessing revision history of a document.
- Section 6.8 - Addition of procedural requirement for accessing a withdrawn or cancelled document.
- Section 7 - Modified the order of the subsections for clarity.
- Section 7.1 - Added DMS process document and DMS Index requirements.
- Section 7.2 - Modified for clarity, added link to the *City* data governance directives found in Corporate Records Management of the OneCity intranet.
- Section 7.3 - Term 'true originals' is replaced with 'originals', added reference to Section 7.7.
- Section 7.4 - Addition of requirement to identify the intended use of a document, in the document itself and also the metadata tag and reference to Section 7.5.
- Section 7.5 - For minimum metadata requirements - replaced 'revision' to issue/version number' and 'revision date' to 'issue/version date', addition - review cycle, document owner, sorted in alphabetical order
- Section 7.6 - Addition of requirement to ensure ease of accessibility and to identify the document type in the Index.
- Section 7.7 - Updated subsection Title (and in the content); formerly this was 'True original status', modified for clarity - for the minimum requirements of identification of document type (DSO, PWP) in metadata and for DSO originals.
- Section 7.8 - Deletion - it may be acceptable to use mixed long date formats.
- Section 7.10 - New added Section 'Periodic Review'.
- Section 7.11 - Updated subsection Title; formerly this was 'Retention' only.
- Section 9 - Addition of contact information for the EDMSs 'apegabsa@edmonton.ca', 'main contacts' column of table 9.1 removed.
- Section 9.1 - Repository 'PEG QMS Docs' is renamed to 'TriDOCS'

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1. Purpose

The purpose of this *Standard Operating Procedure* (*SOP*) is to standardize and define the processes for controlling, retaining, and accessing *technical documents* that support or are derived from the engineering and geoscience work conducted by and for the *City of Edmonton (City)*.

The overall goal is to establish controls for identification, storage, protection, retrieval, retention, and disposition of *technical documents* to ensure the integrity and credibility of the documents.

2. Scope

This *SOP* applies to all *technical documents* that support or are derived from the engineering and geoscience work conducted by and for the *City* and applies to overall *Professional Engineering and Geoscience* (*PEG*) *practice. Technical documents* include *Quality Management System* (*QMS*) *documents.*

Unless otherwise specified within the context, the term 'document' used in this *SOP* refers specifically to *technical documents*. It should be noted that the unqualified word 'document(s)' is intentionally not a defined term. In the *City*, there are various kinds of documents that different groups handle, such as Procurement, Law, Safety, Human Resources, and the *City* Clerk's Office. The *practice of engineering and geoscience* mandates protocols for *technical documents* only. When the word 'document' is used in isolation, care should be taken to consider its context.

3. References

- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0003 Developing and Issuing Standard Operating Procedures, Work Instructions, and Related Documents for Engineering & Geoscience
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- City Administrative Directive A1410C - Corporate Records and Information Management Program and Procedure
- Corporate Records Management
- OneCity Intranet

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in the "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *Quality Management System documents*, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained.

4.1. Document Management System (DMS)

A system and associated workflows, either digital/electronic, physical, or hybrid, that serves as a repository to classify, secure, and retain documents or similar artifacts such as models or *customized software*.

4.2. Document Management System (DMS) Administration

Individuals or groups identified to curate and support a *Document Management System*.

4.3. Electronic Document Management System (EDMS)

An implementation that features integrated software and databases to provide features such as metadata control, automated workflows, automated indexing, organized rights management, and highly configurable search and retrieval functionality. This also includes web based *EDMS*, including Google sites and Google drive.

4.4. Project Document

A class of documents that has the characteristic of being static once finalized. They should never be considered or trusted to be current and must be interpreted in a historical or time line context. Examples include *record documents*, operation and maintenance manuals, specifications, surveys, reports, studies, etc. These are in contrast to *sustaining documents*.

4.5. Quality Management System (QMS) Document

An operational document that typically describes processes to support the *Professional Engineering and Geoscience Quality Management System* (*QMS*). Examples include *Standard Operating Procedures*, *Work Instructions*, or other related documents.

4.6. Sustaining Document

A class of documents that has the characteristic of being regularly updated with the intent for it to be relied upon and trusted as a current or live source. The *City* commits resources and has processes to ensure information in *sustaining documents* is reviewed, updated, and communicated on a regular basis. Examples include *Standard Operating*

Procedures, standards, design manuals, design guidelines, floorplans, single line schematics, process or controls diagrams, etc. This was formerly referenced as a master document.

4.7. Technical Document

A document that typically contains *technical information*. This includes *record drawings/ documents*, *as-built drawings/documents*, *as-acquired documents*, site instructions, change orders, change directives, design guidelines, design manuals, specifications, schematics, and other related documents such as floor plans, operation and maintenance manuals, architectural drawings, reports, etc. *Technical documents* include *Quality Management System documents.* A *technical document* may or may not be classified as a *Professional Work Product* (*PWP*), but all *PWPs* are *technical documents. Technical documents* are never transient in nature.

5. Roles and Responsibilities

5.1. Deputy Officer (DO)

Assists the *Senior Officer* (*SO*) in meeting their responsibilities as required.

5.2. Directors

Accountable for ensuring appropriate *Document Management Systems* (*DMSs*) are developed, resourced, and maintained. Directors will work with *Responsible Members* (*RMs*) as appropriate and coordinate across the *City* to ensure there is clarity of roles for the variety of *DMS* repositories and any confusion of authoritative source or duplication is avoided.

5.3. DMS Administration

Responsible for the routine transactions and movements of *technical documents* through *DMS* processes and updating the associated indexes as required. While some of these operations may be automated by an *Electronic DMS (EDMS),* the responsibility remains with the *DMS administration* to maintain and confirm operations. *DMS administration* is also responsible for *DMS* process documentation, providing training as required, and *continual improvement* of the *DMS*.

5.4. Licensed Professional (LP)

Responsible for ensuring *technical documents* are prepared, managed, and submitted to the appropriate *DMS* as per the applicable processes.

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5.5. Member-in-Training (M.I.T.)

Under the direct supervision of *Licensed Professionals* (*LPs*), responsible for ensuring *technical documents* are prepared, managed, and submitted to the appropriate *DMS* as per the applicable processes.

5.6. Project Managers

Responsible for ensuring *technical documents* are submitted to the appropriate *DMS*. Project Managers are mainly involved with *project documents*.

5.7. Responsible Member (RM)

Accountable for ensuring that the *Professional Work Product* (*PWP*) class of *technical documents* that they *validate* are secured, controlled, and retained in the appropriate *DMS*.

5.8. Senior Officer (SO)

Accountable for the implementation, resourcing, and sponsorship of effective *DMSs* and document management practices.

6. Procedure

The general *DMS* process should include the following steps, as appropriate, for a *technical document* throughout its lifecycle.

6.1. Initiation

Depending on the type of *technical document,* area workflow requirements, and *DMS* implementation, the following steps should apply as appropriate:

- issuance or use of a template
- initial metadata classification to ensure required information is supplied by the requesting entity and available in the document
- setup access control and appropriate electronic rights assignments

6.2. Development

Technical documents are developed, circulated for review, approved, etc., as per the appropriate processes. In particular, for an internally developed *PWP,* this would include final creation of an *authenticated* and *validated* original, physical, or *Digitally Signed Original (DSO),* as per "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products." For *QMS documents*, refer to "COE-PEG-SOP-0003 Developing and Issuing Standard Operating Procedures, Work Instructions, and Related Documents for Engineering & Geoscience."

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6.3. Receipt of a completed technical document

Many *technical documents* will be received in a 'completed' state for *DMS* processing. This may not be a final version in the sense of a *PWP* but completed for a particular milestone, review circulation, or other checkpoint requiring documentation. Such a process may be necessary or desirable for project or operations workflows or tracking reasons and is acceptable as long as the particular document status is clearly indicated.

Metadata classification and verification will ensure all required information is supplied by the submitting entity or available in the document.

If the document was developed within the *DMS,* similar verifications of metadata and a change in location and/or workflow state will occur.

6.4. Approval

If a *technical document* is in its 'final' state, *DMS administration* ensures appropriate *Quality Assurance* and *Quality Control* have been undertaken, and that any required circulation for reviews has been completed. Other required processes, such as *PWP authentication* and *validation* or *SOP* authorization are completed before the *technical document* is submitted to *DMS Administration*.

6.5. Storage

DMS administration securely stores *technical documents* to *DMS* storage. Further changes in location or workflow state will occur as required. Audit trails of past revisions and approvals are preserved.

6.6. Issuance and Access

DMS administration must follow the appropriate *DMS* process for issuing *technical documents* and ensure appropriate users are notified, issued links or copies, and have access. Previous versions of *technical documents* will be accessible, ideally for all users, but at least for *DMS administrators*.

6.7. Revisions and Updates

If *technical documents* are *sustaining document* types, and the *DMS* supports these operations, then the published version is updated every time a new revision is released. The document includes a description of the current revision as a minimum. The revision history of previous versions of the document will be accessible, ideally for all users, but at least for *DMS administrators*.

6.8. Withdrawals or Cancellations

Most *technical documents* are typically not subject to withdrawal or cancellation. However, *QMS documents* may be more frequently withdrawn or cancelled. When a *QMS document* is identified as no longer necessary, a request can be made to the *DMS administration* for its withdrawal or cancellation. Upon approval, the document will be removed from general access, and any references to the document will also be removed. The withdrawn or cancelled document will be stored in the *DMS* archives. Access to these documents will be restricted to *DMS administration* only, to prevent inadvertent use.

7. Requirements

7.1. Documentation

All *DMSs* with *technical documents* must have administrative and operational documentation in the form of formal or informal *Work Instructions* (*WIs*). These *WI*s must address the specific implementation of the above procedure in Section 6 and fulfill the requirements in this section. *DMS* process documentation must describe the requirements of the document workflow, document identification, roles and responsibilities of the individuals involved in the document workflow, control and access, and the withdrawal or cancellation of documents. *DMS* process documentation must not conflict with the requirements of this *SOP*.

All *DMSs* must also maintain an index of the documents retained in the *DMS*. The minimum requirements of a document index is outlined in Section 7.6 of this *SOP*.

7.2. Data Governance

All parties accountable or responsible for curating content for *technical documents* should coordinate across the *City* to ensure there is clarity of roles for the diverse *DMS* repositories to avoid any confusion regarding authoritative sources (i.e.,"a single, trusted, source"). In addition, parties must follow applicable *City* data governance directives found in the Corporate Records Management of the OneCity intranet.

Technical documents, particularly those classified as *PWPs*, are a critical class of data and benefit from rigorous data governance efforts.

7.3. Control, Access, and Integrity

The primary requirement for a *DMS* is implementing controls to ensure integrity, prevent tampering, and maintain appropriate access. *DMSs* must be implemented through a combination of design and protocols to achieve these goals.

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7.3.1. Physical Documents

Physical documents must have a DMS addressing physical security and access to files. This may include keys, authorization protocols for access, etc. There must be protocols for tracking access and a sign out and return process. Ideally, physical originals are also backed up as electronic copies in a DMS. In particular, physical originals must only be released with the approval of an appropriate RM or Director responsible for the DMS.

7.3.2. Electronic Documents

Electronic documents must be stored in a *DMS* that ensures revision and access control. Any electronic storage of originals must conform to the requirements in Section 7.7 below.

7.4. Document Identification—Naming and Numbering

In general, encoding extensive metadata in a document naming or numbering scheme is discouraged. However, a limited mapping is desirable to assist in identification, in particular when a copy of a document is circulated outside of its source *DMS*. When any metadata encoding is used in a document's naming or numbering scheme, there must be a well-defined mapping schema.

Unique alphanumeric document identification (ID) should generally be assigned. *DMS* implementations that utilize a document serial number ID, formal ID naming system, or a hybrid approach are acceptable.

A *DMS* must implement a nomenclature system that ensures unique names or IDs within that specific *DMS.* Additionally, to a reasonable extent, uniqueness should be maintained across the *City*. Ideally, the origin of a *technical document* within a specific *DMS* should be identifiable either through a key value within the document naming convention or via a distinctive format of the document name.

The intended use of a document or its status must be clearly identified. For instance, a document in the 'draft' stage must be clearly indicated within the document itself and through appropriate metadata tagging.

It is acknowledged that when stored in some *EDMSs*, the concept of the document name may vary depending on different views or reports within the system.

Ideally, the content or data within a document should allow for verification against its ID and name when necessary. For additional document identification and metadata requirements, please refer to Section 7.5 of this document.

7.5. Metadata

The following minimum metadata should be included in the index and/or document metadata tags along with any other relevant fields such as spatial information (e.g., facility or GIS coordinates), project stage, etc.:

- author/origination (as applicable)
- description/document name
- document ID
- document owner
- issue/version date
- issue/version number
- review cycle (if applicable)
- status(es) (e.g., *PWP*, *DSO*, draft, *sustaining document, project document,* etc.)

To ensure consistency and accuracy, it is important to align the information inside a document with its metadata as much as possible. This means that data in the document should match details like the document ID, description, and the issue/version number and date.

7.6. Indexes

Every *DMS* must have a reliable and efficient indexing mechanism that allows *technical documents* to be easily searched for and accessed using relevant metadata. *Technical documents* created and received by the *City* must be easily accessible, reliable, and usable by those who are authorized to access them. The document index must identify the document type. *PWPs* and other *DSO* documents must be readily identifiable and accessible through appropriate metadata and/or the document index.

Indexing can be achieved through various methods. It can be implicit, where users search or navigate through a metadata interface. It can also involve the use of physical or digital index tools like spreadsheets or card catalogs. In some cases, more basic implementations may rely on organized physical or digital filing structures.

7.7. Original Status

Electronic *technical documents* that are *authenticated*, authorized, or otherwise approved purely in the digital domain must have their status as originals unambiguously identified through metadata, naming, and/or filing location conventions in the *DMS* they are retained in.

At a minimum, a *DMS*:

- must include the metadata tag for *DSO PWPs*: 'DSOPEGPWP'
- should include a metadata tag for other types of *DSOs*, such as 'DSO'

A physical *DMS* that contains *wet signatures* originals must be identified as the repository for these types of *technical documents.* This is of particular importance for internally generated *PWPs*. While the use of physical *DMSs* are not as common anymore, if there are ongoing needs to store true physical originals, *DMSs* must be marked "Physical Original - Retain."

If an original is a *DSO,* then any printouts are copies; if the original has a *wet signature*, any electronic versions, such as scans, are copies unless they contain all the required digital signatures (i.e., for *authentication* and *validation*).

It is therefore anticipated that legacy *DMSs* of physical files with originals must be retained per Section 7.11 of this *SOP* even if electronic reference copies are stored in an alternative *DMS.*

7.8. Date Format

The requirements for representing dates and times in a *DMS* are generally addressed in "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System" 'Date & Time' Section. It is strongly preferred to use numerically represented *ISO 8601* compliant dates and times for metadata fields or filenames.

All numerically represented dates must follow the *ISO 8601* standard of YYYY-MM-DD. For example, November 30, 2019, would be written as 2019-11-30. In filenames the "-" delimiter may be omitted for brevity if it causes confusion due to other filename delimiters.

Where further refinement is needed, such as specifying time zones, intervals, reduced accuracy, etc., consult this summary.

7.9. Revisions

When revising *technical documents*, each revision must be uniquely identified. This may be achieved by a variety of nomenclature and revision syntax strategies. Internal to the *City,* if a strict numerical scheme is used, revisions should follow a simple positive integer sequence, starting with 01 for the original version. Draft revisions then have an additional decimal version number if required until the document is finalized and then issued with the next integer version. In general, many systems are acceptable but **in no circumstances is it acceptable to revise and circulate documents, or allow to be received revised external documents, without an increment to the revision number/ID.**

To ensure clarity, the revision number and information within the content of a document must match the revision indicated in its name or other metadata. This helps to maintain consistency and avoid confusion in understanding the correct version of the document.

For *technical documents*, and in particular, for *sustaining documents* with a current/published version, audit trails of past revisions must be preserved. Where this is the case, the *DMS* must have a method available, ideally for all users but at least for *DMS administration,* to retrieve these past versions.

7.10. Periodic Review

Periodic reviews of *sustaining documents* are imperative to ensure compliance, accuracy, and document integrity. All *QMS documents* must undergo a review at least once every five years. More frequent reviews may be required by the *DMS* or for specific documents. If there are no revisions required, reissuance of the document is still mandated every five years to maintain up to date records. *Project documents* generally do not require periodic reviews.

7.11. Retention and Disposition

Technical documents serve as essential reference documentation and historical records for a wide range of critical infrastructure assets and systems. As such, *technical documents* have an indefinite retention period. *DMS*s must provide reliable mechanisms for historical archiving and maintaining version history, particularly for *sustaining documents* that have current or published versions.

The destruction of *technical documents* must only be carried out with the approval of the appropriate *City* asset/system owner or the responsible operational area. Such decisions must be made in accordance with the guidelines set forth by the *SO* and appropriate *RM*. Proper approval processes must be followed to ensure the preservation of important information, historical archives, and to maintain compliance with relevant regulations and requirements. Refer to the "City Administrative Directive A1410C - Corporate Records and Information Management Program and Procedure" for information about archival records, disposition, and requirements for vital records.

8. Templates or Forms

- none

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9. Attachments

9.1. Listing of currently known *EDMSs*

The following is a list of the currently known *EDMS* repositories for *technical documents*. For additional information on any *EDMS* listed below, contact apegabsa@edmonton.ca.

Repository Name or Short Description	Applicable Department / Branch / Section	Type(s) of *Technical Documents*	Notes
TriDOCS	*PEG* Practice Office and Various Departments/ Sections	Major *City* Consultant Manuals, Guidelines, & Standards *SOPs* & *WIs* for/from Engineering Services	System of three Google shared drives and document index. Repository for *technical documents.*
Meridian	IIS / IPD / ES	*Record documents* of *City* Facilities *PWPs* for Facility Engineering	When structure complexity, condition, and overall risk indicate requirement.
SAP	*City* Ops - Facility Maintenance & Waste	*Record documents* for Waste, engineering drawings, O&Ms, work orders	
Posse	UPE - Safety Codes	Safety Codes submissions	
Enviso - Environmental Management System Procedures	UPE - Planning and Environment Services	System procedures, *WIs*	
DEDR	UPE - Subdivision and Development Engineering	Development IFC (Site & Roads, including lighting and power)	Google folder and map index
CardeX	*City* Ops/ Neighbourhoods Planning and Design	Transportation project *record documents*	

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Repository Name or Short Description	Applicable Department / Branch / Section	Type(s) of *Technical Documents*	Notes
	& Transportation Planning & Design		
Inmagic	IIS / IPD / ES	Environmental reports	
Intellex	Waste	Procedures	Google folder, website, and Windows server locations
Fleet Unit Files	*City* Ops / Fleet & Facility Services	Unit assets, weight drawing / distribution calculations	*City* network drive (G Drive) - Unit Files
Fleet Engineering	Municipal and Transit Maintenance	Failure analysis, Design, maintenance memos, maintenance practice bulletins, NDT inspection records, drawings and certification documents.	*City* network drive (G Drive), Google drive
ETS Fleet & Facility	LRT Operations & Maintenance	*Record documents* including O&Ms, drawings and specifications	*City* network drive (L Drive), Google Team drive, file room at ROW building, LRV Maintenance office at DL MacDonald
OPS SOPs PARS	Parks and Road Services / Various Departments	*SOP*s for Infrastructure operations & maintenance, traffic, safety, Enviso.	Google Site
eBMS (Edmonton Bridge Management System)	Bridges, Structures & OS Maintenance / Infrastructure Maintenance	Bridge inventory and condition data	*City* network drive, physical archive for bridge files

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City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products

Document #: COE-PEG-SOP-0005

Version: 03

Authorized By:

Nicole Wolfe	2024-08-01	
Name	*Date*	*Signature*

A/Branch Manager Building Great Neighborhoods & APEGA Permit to Practice Senior Officer (SO)
Title

VER	Date	Revision Summary	Author	Checked	Appv'd
03	2024-08-01	Refer to revision notes for details	Carla Wong	Daryle Tilroe	Nicole Wolfe
02	2022-02-11	Updates from Practice Review and for Document Authentication, Validation, & Control	Daryle Tilroe	David Clarke	Nicole Wolfe
01	2020-10-19	Original Issue	David Clarke	Daryle Tilroe	Anjum Mullick

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Applicability

This *Standard Operating Procedure* (*SOP*) is applicable to all individuals involved with *Professional Engineering and Geoscience* work, particularly those *verifying, authenticating,* or *validating Professional Work Products* produced at the *City of Edmonton.*

Synopsis

This *SOP* provides the minimum requirements for *verification*, *authentication,* and *validation* of engineering and geoscience *Professional Work Products*.

Revision Notes

Note: The Technical Memo "COE-PEG-TMO-002 Authentication & Validation Date Format Bulletin ISO 8601" is withdrawn effective the release of v03 of this SOP.

Version 03 revision contains minor link updates, refined language for clarity and adherence to style guide. Major updates include:

- Senior Officer (SO) and Deputy Officer (DO) - formerly the Chief Operating Officer (COO) and the Deputy COO, is replaced throughout the document.
- Section 1 - revised the 'Purpose' to apply to all LPs (not just APEGA LPs), and limited purpose to providing requirements for City LPs when authenticating and validating (not for external consultants to follow this procedure)
- Section 2 - revised to only apply to activities carried out by the City (this SOP does not apply to consultants providing PWPs for the City). Removed the sentence "outside consultants are expected to follow this SOP or propose an acceptable alternative to the CoE'' as this requirement is met under outsourcing requirements
- Section 3 - Contains minor links and version updates. Additions include:- "Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta", "APEGA Professional Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings", "Stamping Guidelines for Professional Technologists and ASET Permit Holders", "Notarius Digital Certificate Signing Setup Process & FAQ", "Occupational Health and Safety Code" and "National Building Code: 2023 Alberta Edition"
- Section 4 - New/Modified Definitions:
    - As-Built Document/Drawing - modified for clarity
    - Consultant(s) - removed from definitions as common term
    - Record Document(s)/Drawing(s) - modified for clarity
    - Standard Drawing - changed to 'reference standard design' rather than 'standard drawing' as 'reference standard design' includes reference drawings, designs, specs, etc. This is updated throughout the document.
- Section 5 - New/Modified Roles and responsibilities:

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- Edited roles for: Senior Officer (former COO), Deputy Senior Officer (former Deputy CO), LPs, and RMs to relate specifically to meeting requirements of authentication and validation.
- Added roles for: Author, Checker, Project Manager, Professional Practice Leader, PEG Quality Manager, Reviewer
- Removed roles for: Contributors (replaced by Author)

- Section 6 -
  - Sub-section 6.2 - revised 'The PWP is prepared by the LP or under their direct supervision and control' to 'The PWP is prepared by the author or LP'
  - Sub-section 6.4 added that LP authenticates the PWP if they prepared it themselves, if prepared under their direct supervision and control, or after their thorough review
  - Sub-section 6.7 added reference to "COE-PEG-SOP-0004 Engineering & Geoscience Document Management"
- Section 7 -
  - Sub-section 7.1 - revised verification requirements for clarity and ease of understanding; removed the requirement to document risk assessment when authenticating LP is the same as the checking LP, and added that the RM accepts the associated risks when performing the final validation. Added "final draft" PWP in the verification step because it's not a PWP until it is authenticated. Added 'calculations' under areas where professional judgment has been exercised (added term 'professional' before judgment for clarity)
  - Sub-section 7.2.1 - added reference to "National Building Code: 2023 Alberta Edition", "Occupational Health and Safety Code" and Attachment 9.2
  - Sub-section 7.2.2 - added 'Dates must be legible when printed or viewed'; date format updated in response to APEGA's clarification that ISO 8601 date format is acceptable
  - Sub-section 7.2.3 - new sub-section 'APEGA ID in authentication and validation' and content
  - Sub-section 7.2.4 (former 7.2.3) - added clarity on the requirement that LP can authenticate only when they have thoroughly reviewed the documents and accept professional responsibility for the engineering and geoscience involved (among the other listed items); revised 'the LP must be a member of APEGA or ASET, in good standing' to 'with appropriate practising status and no practice restrictions'; added links to APEGA Member and Permit Directory and ASET Member Roster
  - Sub-section 7.2.5 (former 7.2.4) - added requirement 'stamps must be printed or applied in black ink, and must not be resized'; added reference to "Stamping Guidelines for Professional Technologists and ASET Permit Holders"; added that ASET also uses Notarius as its sole provider of digital signatures
  - Sub-section 7.2.6 (former 7.2.5) - added 'RM validating a PWP must have knowledge that the authenticating LP is operating within their area or defined scope of practice'; added reference to APEGA Code of Ethics; described exceptions in validation process in the case of overlap in the professions

- Sub-section 7.2.7 (former 7.2.6) - added requirement to ensure validation occurs on the same or later date than authentication, close to authentication and stamps be printed or applied in black ink, and must not be resized
- Sub-section 7.3 - modified title; formerly 'Standard Drawings, Details, and Prototype Specifications', significant update to the 'Suggested Disclaimer'
- Sub-section 7.4 - significant update to the 'Intent of Use Template'
- Sub-section 7.6 - modified title to include 'Retention and Revisions', formerly the title was 'Revisions', added reference to "COE-PEG-SOP-0004 Engineering & Geoscience Document Management"
- Sub-section 7.7 - added that the City has additional requirements for internally produced PWPs that do not apply when consultants produce PWPs, added reference to "COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements"
- Sub-Section 7.8 - new content and title 'Other Professions and Overlapping Practice'; former sub-section 'Environmental Site Assessment and Remediation PWPs' content included within the revised sub-section
- Sub-section 7.9.1 - added that in cases where urgent engineering or geoscience solutions are needed an LP must authenticate the PWP as soon as practicable
- Sub-section 7.9.2 and 7.9.3 - bullets and sub-items modified for flow and clarity; removed requirement that emergency response SOPs and WIs be approved by the Senior Officer or Deputy Officer; references to 'technical memo' replaced with 'PWP, professional memo or a professional report'
- Sub-section 7.10 - replaced 'formal opinion' with 'professional opinion'
- Sub-section 7.11 - content removed to eliminate duplication as processes are described in "COE-PEG-SOP-0004 Engineering and Geoscience Document Management"
- Sub-section 7.12 - procurement of customized manufactured goods broadened to include other types of customized goods beyond just police/fire. Bridge inspection reports removed as they are included in Table 9.1 and 9.2.

- Attachment 9.1 - Title revised; formerly 'PWP Authentication Requirement - Table'; Content revised for clarity and to include additional documents, Departments and Sections.
- Attachment 9.2 - Removed former attachment 9.2 'Alphabetic Abbreviations for Month - Table'; added new attachment 9.2 'Typical Outputs Not Requiring Authentication'

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1. Purpose

This *Standard Operating Procedure* (*SOP*) documents the roles, responsibilities, and minimum requirements for those involved in *verifying*, *authenticating,* or *validating Professional Work Products* (*PWPs*) created by *Licensed Professionals* (*LPs*) within the *City of Edmonton* (*City*).

2. Scope

This *SOP* applies to all engineering and geoscience activities carried out by the *City*. It aims to ensure compliance with the *Engineering and Geoscience Professions Act* (*EGP Act*) and *APEGA* requirements, which mandates *authentication* and *validation* of *PWPs* for use in Alberta. This document establishes minimum requirements for the *City* to meet or exceed regulatory requirements.

3. References

- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management
- COE-PEG-SOP-0007 Verification and Authentication Requirements for Engineering & Geoscience Software
- COE-PEG-SOP-0008 Record Documents and Redlines
- COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements
- COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements
- APEGA Professional Practice Standard for Authenticating Professional Work Products
- APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing of Engineering and Geoscience
- Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta Joint Practice Standard
- Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta
- APEGA Professional Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings
- Stamping Guidelines for Professional Technologists and ASET Permit Holders

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- Notarius Digital Certificate Signing Setup Process & FAQ
- Occupational Health and Safety Code
- National Building Code: 2023 Alberta Edition

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *Quality Management System* (*QMS*) *documents*, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained.

4.1. As-Built Document/Drawing

A document/drawing that reflects the installed, fabricated, constructed, or commissioned condition of a *Professional Work Product* (*PWP*) and has typically been generated or marked up by someone other than the *Licensed Professional* who prepared the *PWP*. They are also called "*redline drawings*." These drawings are intended to incorporate on-site conditions not represented in the original *PWP*. [source: "APEGA Professional Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings"]

4.2. Discipline

A specific field of practice within a profession (e.g., electrical engineering, mechanical engineering, geophysics, geochemistry).

4.3. Record Document(s)/Drawing(s)

A final document/drawing *authenticated* by a *Licensed Professional* (*LP*) to document design changes for which they accept professional responsibility. These changes may have been issued and *authenticated* previously through change orders, directives, or site instructions. *Record drawings* incorporate both original design elements and any modifications into one final drawing/document set. The *LP* is accountable for *authenticating* these in compliance with "APEGA Professional Practice Standard for Authenticating Professional Work Products." However, it is important to note that *authenticating record drawings* does not imply that the *LP* confirmed the actual field installation. [source: "APEGA Professional Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings"]

4.4. Reference Standard Design

A design drawing or detail that is intended to be used in more than a single design or project application.

4.5. Verification (or Verify)

An independent check that confirms the *Professional Work Product* is correct and complete and that it meets all regulatory and client requirements.

5. Roles and Responsibilities

5.1. Author

Prepares a *PWP.* This may include *LP*s, *Professional Licensees* (*PLs*), *Members-in-Training* (*M.I.T.*s), drafters, *Professional Technologists (P.Techs*), technologists, technical specialists, scientists, or administrative personnel.

5.2. Checker

Performs the independent check of a *PWP*, prior to *authentication*.

5.3. Deputy Officer (DO)

Supports the *Senior Officer* (*SO*) in meeting their responsibilities and obligations for *authentication* and *validation.*

5.4. Licensed Professionals (LPs)

Responsible for *authenticating PWPs* for which they are taking professional responsibility.

5.5. Members-in-Training (M.I.T.s)

Responsible for carrying out their work only under the *direct supervision and control* of *LPs* and ensuring that the *PWPs* they prepare are *authenticated* by the supervising *LP*.

5.6. PEG Quality Manager

Responsible for implementing and communicating *authentication* and *validation* requirements across the *City* through process documentation and training. With the support of the *Professional Practice Leader* (*PPL*), the *PEG Quality Manager* also offers expert guidance to confirm the validity of a *PWP*, i.e., to determine if the *technical document* constitutes a *PWP*, where needed.

5.7. Professional Practice Leader (PPL)

Responsible for overseeing the *PEG Practice Office* in defining and communicating *authentication* and *validation* requirements across the *City*, providing expertise and direction to ensure compliance. The *PPL* offers expert guidance to confirm the validity of a *PWP*, determining if the *technical document* constitutes a *PWP*, where needed.

5.8. Project Managers

Responsible for ensuring *PWP* deliverables submitted to the *City* by external consultants or produced by the *City* comply with the *authentication* and *validation* requirements outlined in this *SOP*.

5.9. Responsible Member (RM)

Responsible for *validating PWPs* prepared by *LPs* within their area of oversight. *RMs* also advise other *LPs, M.I.Ts, PLs,* or *P.Tech.s* on the requirements of the *EGP Act*, *APEGA* standards, and the *Professional Engineering or Geoscience* (*PEG*) *SOP*s.

5.10. Reviewer

Thoroughly reviews the *PWP* before it is submitted for an independent check.

5.11. Senior Officer (SO)

Accountable for meeting the legal obligations of the *APEGA Permit to Practice* on behalf of the *City*, including meeting *authentication* and *validation* requirements.

6. Procedure

The following steps must be followed in accordance with the requirements of this *SOP,* as further detailed in the 'Requirements' section:

6.1. Initiate

Determine whether *authentication* is required. If so, both the *LP* who will be *authenticating* the *PWP* and the *RM* who will be *validating* the *PWP* is identified.

6.2. PWP Development

The *PWP* is prepared by the author(s).

6.3. Verify

The completed *PWP* is *verified* to be correct and complete.

6.4. Authenticate

The *LP authenticates* the *PWP* if they prepared it themselves, if it was prepared under their *direct supervision and control*, or after *thoroughly reviewing* it.

6.5. Validate

The *RM validates* the *PWP.*

6.6. Issue

The *PWP* is issued as required by contract or project plan.

6.7. Retain

An original copy of the *PWP* is retained. Refer to "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

7. Requirements

7.1. Verification

The following *verification* requirements apply before a product is *authenticated*:

a. Prepare: The author must thoroughly self-check the final draft *PWP* before requesting *verification*. The author affixes their initials to the draft *PWP*.

b. Review: The *LP* who will be eventually *authenticating* and accepting professional responsibility of the *PWP* must *thoroughly review* the final draft *PWP* (unless they are the author who prepared it). The reviewer adds their initials.

c. Check: The final draft *PWP* is independently checked by another *LP* with similar or better competency in the subject matter.

As a rule, the checker should not be the same individual as the *authenticating LP*. However, if no such independent *LP* exists, the *validating RM* may approve an exception. By eventually *validating* the *PWP*, the *RM* has considered and accepted the associated risks of the checking *LP* being the same as the *authenticating LP*. In these special cases, the *authenticating LP* can be the same person as the checker. The checker affixes their initials to the *PWP*. If the checker finds issues with the *PWP*, these must be addressed by the *authenticating LP*.

Where multiple *disciplines* are involved, the final draft *PWP* must be checked by an individual from each *discipline*. Each checker initials the *PWP*.

All work submitted for independent check must be complete and should be accompanied by adequate design or work documentation. The documentation may cover areas where professional judgment has been exercised, such as:

- key design concepts

- key decision points
- codes and standards applied
- base assumptions
- limitations
- calculations

The independent check will include reviewing the work for thoroughness, completeness, accuracy of calculations, correct applications of standards and codes, and correct application and integration of apparatus and material. The check should ensure that the work will result in a product that is safe and meets appropriate codes and standards.

Any new code and standard or revision to a code and standard, new areas of work, or work with a high risk potential, must undergo an additional independent check to identify any items that may have been overlooked prior to final *authentication* by the *LP* taking responsibility for the work.

Once the final draft *PWP* is *verified*, it is ready to be *authenticated* and then passed to the *RM* for *validation*. Under no circumstances should a *PWP* be *authenticated* without being *verified*.

7.2. Authentication and Validation

7.2.1. What requires authentication and validation?

PWPs must be *authenticated* and *validated*, whether prepared for internal or external use. *Authentication* and *validation* of *PWPs* is a legislated requirement and is not optional.

The "APEGA Professional Practice Standard for Authenticating Professional Work Products" outlines a three-part test to determine if an artifact is considered a *PWP* and therefore requires *authentication* and *validation*. The test asks:

- does the output contain *technical information*?
- is the *technical information* complete and final for the intended purpose of the output?
- will others rely on the *technical information* related to the output's intended purpose?

If the answer to all three questions is yes, then the artifact is considered a *PWP* and must be *authenticated* and *validated*. (Refer to "APEGA Professional Practice Standard for Authenticating Professional Work Products" for additional information).

Artifacts created for, or under the authority of, any legislative body or authority having jurisdiction, who require professional *authentication* and *validation* to

comply with governing laws, codes, or standards, must also be *authenticated* and *validated* by the appropriate *LP* and *RM*.

Other legislation and codes, such as the "National Building Code: 2023 Alberta Edition)" and the "Occupational Health and Safety Code," have requirements for professional engineering involvement and *authentication*. *LPs* must ensure these requirements are met. For example, the "Occupational Health and Safety Code" [Part 3(13)] has specific clauses that require employers to ensure that manufacturer's specifications exist and if not, that professional engineers develop procedures or certify the equipment every 12 months.

See 'Attachment 9.1 Typical Output Authentication Requirements' for a partial list of artifacts typically produced by the *City* and whether they need to be *authenticated* and *validated*. In addition, 'Attachment 9.2 Typical Outputs not Requiring Authentication' lists artifacts that typically do not require *authentication* and *validation*.

7.2.2. Date format in authentication and validation.

Dates must be legible when printed or viewed. In response to *APEGA's* clarification that *ISO 8601* date format is acceptable for *authentication* and *validation*, *ISO 8601* compliant short-format dates YYYY-MM-DD (e.g., 2022-03-23) must now be used for *authentication* and *validation* for internally developed *PWPs*, effective from 2023-12-19.

Users of *digital signatures*, with an electronic stamp graphical image in ConsignO, can easily implement this required date format. Refer to "Notarius Digital Certificate Signing Setup Process & FAQ" section 'Changing Date Format—ConsignO' for guidance.

7.2.3. APEGA ID in authentication and validation

The *APEGA* ID must be clearly visible when printed or viewed. *APEGA* IDs should be placed adjacent to the stamp image for *authentication* if this information is not already embedded within the stamp image itself. For *validation*, the *APEGA* ID of the *RM* performing *validation* must also be included.

7.2.4. Who can authenticate?

An *LP* can only *authenticate* a *PWP* and accept professional responsibility for the engineering and geoscience involved when:

- they have personally prepared the *PWP*
- the *PWPs* have been prepared under their *direct supervision and control*; or

- they have *thoroughly reviewed* the *PWP*

In addition, the *LP* must:

- be a registered member of *APEGA or ASET*, with appropriate *practising status* and no practice restrictions (this can be verified by checking the APEGA Member and Permit Directory or ASET Member Roster)
- be competent in the subject matter. In the case of a *PL or P. Tech.*, the work must be within their approved and defined *scope of practice,* and
- only *authenticate PWP*s within the profession they are registered in (i.e., engineering or geoscience)

Where more than one *LP* of the same *discipline* and *scope of practice* has contributed to the *PWP* preparation, only one of the *LP*s must *authenticate* the *PWP*. This will generally be the more senior member of the team or the one who has contributed the most. In either case, by *authenticating* the *PWP,* they are taking professional responsibility for the entire *PWP*.

Where more than one *LP* of either different *disciplines*, or in the same *discipline* but with a different *scope of practice*, has contributed to the *PWP* preparation, the *PWP* must be *authenticated* by the *LP* taking responsibility for each *discipline* or *scope of practice* in accordance with the "APEGA Professional Practice Standard for Authenticating Professional Work Products." Each *LP* who *authenticates* must clearly mark the sections of the work for which they are professionally responsible on the *PWP*.

7.2.5. How to authenticate?

Note that simply initialing or signing a document does not imply *authentication*. The *LP's* professional stamp must be applied and it must be dated and signed, either physically or digitally. Also, stamps must be printed or applied in black ink, and must not be resized. For *APEGA LPs*, *APEGA* IDs must also be inserted.

Refer to the "APEGA Professional Practice Standard for Authenticating Professional Work Products" for detailed instructions and examples for *APEGA LPs.* Refer to "Stamping Guidelines for Professional Technologists and ASET Permit Holders" for *ASET LP*s. Not *authenticating* a *PWP* is a violation of the *EGP Act.*

In summary:

7.2.5.1. Physical *authentication* and *wet signatures* require *LPs* to have their blank stamp printed on or applied to the *PWP*, along with the *authentication* date. *APEGA LP*s must also include their *APEGA* ID (if not already on the

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stamp graphic). The *LP* must then sign across their stamp, in permanent ink, without obscuring their stamp's name or other inserted information.

7.2.5.2. Digital *authentication* requires using *digital signatures* to *authenticate* electronic original documents. This is accomplished using a *digital signature* certificate obtained through Notarius and approved by *APEGA. ASET* also uses Notarius as its sole provider of *digital signatures*. All associated graphical representation of stamps must be obtained through *APEGA* or *ASET*. Any graphical representations, scanned stamps, or scanned signatures without *digital signature* certificates on the file(s) are not acceptable for *authentication* of *PWP* electronic originals. The graphical representation applied with the certificate must include the *LP's* stamp image and signature along with the date the certificate was applied. *APEGA LP*s must also include their *APEGA* ID. Digital artifacts, properly *authenticated* and *validated,* with *digital signature* certificates are classified as *Digitally Signed Originals (DSOs)*.

7.2.6. Who can validate*?*

An *RM validating* a *PWP* must:

- be *practising* under the same *City Permit to Practice* as the *authenticating LP*
- have knowledge that the *authenticating LP* is operating within their area or defined *scope of practice*
- confirm the *PWP* has been *verified* and ensure the *authenticating LP* is different from the checking *LP*, as described in Section 7.1. If they are not different, confirm that the risk has been deemed acceptable before *validation*
- have confirmed that the *PWP* has been prepared in accordance with the *City's* "COE-PEG-SOP-0001 Professional Practice Management Plan," applicable *QMS SOPs,* and the APEGA Code of Ethics
- be a different person than the *authenticating LP* unless the *LP* is the also the only *RM* for that profession
- typically *validate PWPs authenticated* by an *LP* of the same profession. (i.e. engineering *PWPs* are *authenticated* by an engineering *RM*, geoscience *PWPs* are *authenticated* by a geoscience *RM*) unless overlap in the professions exist, as described in "APEGA Professional Practice Standard for Authenticating Professional Work Products"

Typically, only one *validation* should exist on a *PWP* unless it involves both engineering and geoscience. In such cases, one *RM* from each profession should

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validate the respective engineering or geoscience work, unless it falls within a shared area of practice. If it is not feasible for one *RM* to *validate* a *PWP* within one profession, another *RM* may also *validate*. However, if there are multiple *validations* on a *PWP*, *RMs* must indicate which *authentication* each *validation* applies to. At the *City*, *RMs* also *validate PWPs authenticated* by *ASET LPs*.

7.2.7. How to validate?

Note that an *RM* simply initialing or signing a document does not imply *validation*. The *City's Permit to Practice* stamp must be applied, *RM APEGA* ID included, and it must be dated and signed, either physically or digitally, by an *RM*. Ensure that the *validation* date is the same as or later than the *authentication* date, and that *validation* occurs close to the *authentication*. Note, stamps must be printed or applied in black ink, and must not be resized.

Refer to the "APEGA Professional Practice Standard for Authenticating Professional Work Products" for detailed instructions and examples.

In summary:

7.2.7.1. Physical *validation* and *wet signatures* require *RMs* to have a blank *City Permit to Practice* stamp printed on the *PWP*, along with the *validation* date, their printed name (*City* requirement), and their *APEGA* ID inserted. The *RM* must then sign the *Permit to Practice* stamp beside their printed name, in permanent ink. Note that for *PWPs* produced by the *City,* a *Permit to Practice* stamp graphic is required and the use of physical (i.e., rubber) *Permit to Practice* stamps are not permitted. The blank *Permit to Practice* stamp graphic can be obtained from the *PEG Practice Office* or this file location and must only be shared with *RMs*.

7.2.7.2. Digital *validation* requires using *digital signatures* to *validate* electronic original documents. This is accomplished by using a *digital signature* certificate obtained through Notarius and approved by *APEGA.* Preferably, *RMs* should obtain a customized version of the *City Permit to Practice* stamp from the *PEG Practice Office.* Alternatively, they can access it from this file location shared exclusively with *RMs*. Any graphical representations, scanned stamps, or scanned signatures without *digital signature* certificates on the file(s) are not acceptable for *validation* of *PWP* electronic originals. The graphical representation applied with the certificate must include the *City Permit to Practice* stamp and the *RM's APEGA* ID, printed name (*City* requirement), and signature along with the date the certificate was applied. Digital artifacts, properly *authenticated* and *validated,* with *digital signature* certificates are classified as *DSOs*.

7.3. Reference Standard Design, Details, and Prototype Specifications

Reference standard design, details, and prototype specifications must normally be *authenticated* and the *LP* must sufficiently limit or specify the conditions under which these elements can be used. This must be explicitly identified in artifacts used as guidelines, manuals, or standards but may be done as an *authentication* index page or similar. If this is not assured, then these elements must not be *authenticated*.

Regardless of *authentication,* when a *reference standard design*, detail, or specification is being incorporated into a specific design implementation, an *LP* must determine if it is suitable for its intended purpose, adjust for specific application as required, and then *authenticate* the final design where any of these elements are integrated. While it may be wise to retain evidence of the original source, any prior *authentication* on the original *reference standard design*, detail, or prototype specification must be removed. The preceding requirements of this paragraph must be clearly communicated to any *LP*, internal or external, utilizing a *reference standard design*, detail, or specification.

Suggested Disclaimer:

This reference standard design/drawing/detail and/or specification provides the City's typical general arrangement and requirements. Representations may not be to scale, may be substantially schematic in nature, or require further elaboration and development. This document is not suitable for specific implementation without review and modification by a competent designer. The designer must adjust and supplement it to provide a complete, functional design that conforms to the City's requirements. They must ensure the size, location, and spacing of all elements, and all components/specifications, are suitable and safe for the use and location intended, and any applicable code, legislative, and authority requirements are adhered to. Accessibility, operational, and maintenance requirements must also be addressed. Deviations from the represented nominal design parameters, questions of intent or accuracy, or any other apparent conflicts, shall be resolved with an appropriate City representative. When using any aspect of this document, the designer must remove any previous authentication, note provenance as appropriate, and apply their own authentication as required.

7.4. Design Standards, Guidelines, or Manuals

As part of its operations and development responsibilities, the *City* creates a variety of design standards, guidelines, and manuals for both internal and external reference. These artifacts are created to guide the creation of many elements of municipal infrastructure. While they are not final designs themselves, they usually meet the requirements of being a complete *PWP* for their intended audience. As such, they must be *authenticated* and *validated*. However, for the greatest possible clarity, they should carry an intent of use statement and a *reference standard design*/drawing/detail disclaimer where appropriate.

Intent of Use Template:

This [section/volume/manual/guideline/(combination)] was developed for establishing [standards/guidelines(or combination)] for the City of Edmonton expectations in the [design/construction/(or combination)] of their [roadway/transportation/landscape/open space/facility/(or combination)] assets. Care has been taken to confirm the accuracy of the information contained herein. The views expressed herein do not necessarily represent those of any individual contributor. As the design of the assets and systems described herein continually evolves, and practices change and improve over time, it is necessary to regularly consult relevant technical standards, codes, and other publications rather than relying on this publication exclusively. The City of Edmonton, authors, and reviewers emphasize that this document does not constitute a project-specific design. As such, no part of this document alleviates the responsibility of the professionals retained to design and/or construct specific projects from taking full responsibility and authenticating their designs in accordance with APEGA, AALA, AAA, NationalBuilding Code: 2023 Alberta Edition, and any other statutory or safety requirements.

Any reference standard design/drawing/detail and/or specification herein provides the City's typical general arrangement and requirements. Representations may not be to scale, may be substantially schematic in nature, or require further elaboration and development. This document is not suitable for specific implementation without review and modification by a competent designer. The designer must adjust and supplement it to provide a complete, functional design that conforms to the City's requirements. They must ensure the size, location, and spacing of all elements, and all components/specifications, are suitable and safe for the use and location intended, and any applicable code, legislative, and authority requirements are adhered to. Accessibility, operational, and maintenance requirements must also be addressed. Deviations from the represented nominal design parameters, questions of intent or accuracy, or any other apparent conflicts, shall be resolved with an appropriate City representative. When using any aspect of these contained documents, the designer must remove any previous authentication, note provenance as appropriate, and apply their own authentication as required.

7.5. PEG Software

PEG software (e.g., a spreadsheet containing *technical information*) which has been developed by or for the *City* and which incorporates the *practice of engineering or geoscience* are considered digital *PWP*s, and must be *authenticated* in accordance with the "COE-PEG-SOP-0007 Authentication Requirements for Authentication Requirements for Engineering & Geoscience Software."

7.6. Retention and Revisions

In all cases, an original *authenticated* and *validated PWP* must be retained and revised in accordance with "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

Revision control is paramount and *PWP*s must follow and display a clear chronological numbering convention, such as v01, v02, Issue A, Issue B, etc., depending on the type of *PWP*.

All *PWP* templates (drawings, documents, etc.) should have a transactional way of recording revision history.

Where a previously *authenticated* and *validated PWP* is being revised, one of the following applies:

a. The *LP* who *authenticated* the original *PWP* also *authenticates* the revised *PWP*, taking full professional responsibility for the complete, updated *PWP*. This is the preferred method whenever possible.

b. When the original *authenticator* is not able to *authenticate* the revision, another *LP* must take responsibility for the revised *PWP* as follows:

   i. The *LP thoroughly reviews* the *PWP* as a whole, with particular attention to the impacts of the revision, and *authenticates* the *PWP* taking professional responsibility for the complete, updated *PWP*.

      Revisions to an *authenticated* document which change the existing design intent with respect to service and safety factors require the *LP* to accept responsibility for the whole new design; or

   ii. The *LP authenticates* the revision, in a manner that clearly indicates the revisions, the *LP*'s acceptance of responsibility for the revisions and the effects of those revisions. Care shall be taken in documenting the revisions to clearly identify the boundary of professional responsibility between the original and revised documents.

In either case, the resultant new revision must be appropriately *validated* following *authentication.*

7.7. Outsourcing to External Consultants

Outsourcing of *PEG* work must comply with the "APEGA Practice Standard for Relying on the Work by Others and Outsourcing of Engineering and Geoscience" and must comply with the requirements outlined in "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements."

If the situation arises, where the *City* collaborates on a design with an external consultant, a separate *PWP* reflecting the *City's* contribution must be issued.

PWPs prepared by external consultants must not be *validated* by the *City*. Dual permitting is not allowed, except with the express permission of the *SO*.

The *City* accepts *PWPs* produced by outside consultants, provided they meet *APEGA's* requirements. The *City* has additional requirements for internally produced *PWPs* that do not apply when consultants produce *PWPs*. Please refer to "COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements" for acceptable *authentication* and *validation* examples.

7.8. Other Professions and Overlapping Practice

APEGA recognizes the interdisciplinary nature of some work in Alberta described in the following sections. In these cases, work can be performed by other professionals, provided that these professionals certify their work according to their regulatory standards. If the work is performed by an *LP*, they must still *authenticate* their work to comply with this *SOP* and *EGP Act.*

7.8.1. Environmental Site Assessment and Remediation PWPs

As per the "Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta Joint Practice Standard," Environmental Site Assessments and Remediation *PWP*s may be *authenticated* by a professional who is a member in *good standing* of any of the following:

- Alberta Institute of Agrologists
- Alberta Society of Professional Biologists
- *APEGA*
- *ASET*
- Association of the Chemical Profession of Alberta
- College of Alberta Professional Foresters
- College of Alberta Professional Forest Technologists

7.8.2. Wetland Science PWPs

APEGA's Joint Practice Standard "Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta" recognizes the interdisciplinary nature of wetland science, design, and engineering in Alberta, and describes the professionals who can *authenticate* wetland related documents. The following professionals in *good standing* with their respective regulatory bodies may *authenticate* work as described in *APEGA's* standard:

- *LPs* registered with *APEGA* or *ASET*
- professional agrologists or registered technologists (agrology)
- professional biologists
- professional chemists
- registered professional foresters and forest technologists
- professional landscape architects
- professional planners
- professional land surveyors

7.9. Field Revisions and Reviews

7.9.1. General

Any design revisions, change orders, field or operation instructions, that constitutes a *consequential change to* a previously *authenticated PWP,* or field review or inspection reports that meet the requirements of the *authentication* test must also be *authenticated*.

This *authentication* will normally be completed in accordance with the requirements of this *SOP*.

The "APEGA Professional Practice Standard for Authenticating Professional Work Products" recognizes that there are times when urgent engineering or geoscience solutions need to be carried out which do not always allow sufficient time for the formal issuance of an *authenticated PWP*.

The following are examples of where this may apply:

- emergency repairs are required to an asset which is under continuous operation and a situation exists that poses an **immediate** threat to safety, health, welfare, or the environment
- a delay will result in a costly construction delay, but there is no immediate threat

In either case above, an *LP* must *authenticate* the *PWP* as soon as practicable.

7.9.2. Continuous Operations

This section applies when emergency repairs or alterations are required to an asset which is under continuous operation.

The *RM,* in conjunction with the operations team and other relevant stakeholders, must create an emergency response *SOP*. The emergency response *SOP* must define the process to be followed when emergency repairs, which require the involvement of a *LP*, are required. The emergency response *SOP* must include:

a. a process for contacting the appropriate *LP*

b. a process to define the limits of responsibility and authority of the *LP*

c. an escalation process defining when and how to notify the *RM* and other appropriate authorities, where required

d. provisions to confirm with the *LP* and the operations team that the asset can continue to operate safely until emergency repairs are completed

e. provisions to obtain the *LP's* decision to proceed without an *authenticated PWP* due to the urgency of the situation

f. provisions to obtain *LP's* approval for the recommended change or direction, either in writing or verbally

Each time this emergency response *SOP* is used, its output must be documented in a follow up email, *PWP*, professional memo or a professional report as soon as practical and shared with all relevant stakeholders. This email or memo must include:

- the circumstances surrounding the need for the change or revision
- the details of the required change or revision
- a summary of the key factors in the professional evaluation or assessment used to determine that an immediate change or revision needed to happen before *authentication*.
- next steps, identifying the party responsible if the repair was temporary and there was a term associated with the *authenticated* modification

It is the responsibility of the initiating *LP* to ensure a *PWP* is formalized and *authenticated* as soon as practical.

When an asset that has been closed due to structural or other technical concerns, repairs can be executed under the appropriate *LP*'s supervision. However, an *authenticated PWP* is required before reopening the asset.

7.9.3. Construction Delays

This section applies when urgent changes are required to an asset currently under construction but not currently in operation. This may occur when construction delays can have significant cost and schedule impacts.

The *RM* in conjunction with the project delivery section and other relevant stakeholders must create an urgent response *SOP or Work Instruction (WI)*. The scope thereof is typically asset based. The urgent response *SOP/WI* must define the process to be followed when urgent changes, which require the involvement of a *LP*, are required. This urgent response *SOP* or *WI* must include:

a. a process for contacting the appropriate *LP*

b. a process to define the limits of responsibility and authority of the on-call *LP*

c. an escalation process defining when and how to notify the *RM* and Project Manager, if required.

d. provisions to obtain the *LP's* decision to proceed without an *authenticated PWP* due to the urgency of the situation.

e. provisions to obtain the *LP's* approval for the recommended change or direction, either in writing or verbally

Each time this urgent response *SOP* or *WI* is used, its output must be documented in a follow up email, *PWP*, professional memo or a professional report as soon as practical. This email or memo must include:

- the circumstances surrounding the need for the change or revision
- the details of the required change or revision
- a summary of the key factors in the professional evaluation or assessment used to determine that an immediate change or revision needed to happen before *authentication*

The *PWP* is formalized and *authenticated* as soon as practical. The asset must not be turned over to operations until an *authenticated PWP* is received.

7.10. Letters, Memos, Emails, Verbal, or Other Communications

Any letter, memo, email, verbal or other communication expressing a professional opinion or recommendation that meets the requirements of a *PWP* must be either *authenticated* and *validated* at initial issuance, as soon as practicable thereafter (having been issued as a non-*authenticated* and non-*validated* draft), or have the *technical information* contained therein transferred into a *PWP* format more amenable to *authentication* and *validation* as soon as practical.

The latter allowances are to address occasions where, due to the requirements of continuous operations or urgent/emergency situations, certain communications that would be considered *PWP*s are issued by *LP*s without being properly *authenticated* and *validated*.

Examples include ad hoc emails, texts, verbal instructions, or draft memos where *RM validation* is not immediately available. In all cases, these communications must make it clear that they are professional instructions, formal opinions, or recommendations. This can be achieved by way of a signature block that identifies the *LP's* professional designation (P.Eng., P. Geo., or P.L. (Eng.), P.Tech., etc.) or clear verbal equivalent. Then,

as previously directed, the professional advice and/or *technical information* must be reissued in a properly *authenticated* and *validated* format.

7.11. Document Management

For document management requirements related to identification, storage, protection, retrieval, and accessing *technical documents*, including *PWPs*, refer to "COE-PEG-SOP-0004 Engineering and Geoscience Document Management."

7.12. Additional Requirements

Additional requirements, where required, must be specified in section-specific *SOP*s. These additional requirements must include the following:

a. Equipment Certification. Where equipment is modified or otherwise utilized outside of manufacturer specifications. Note that these then become customized engineered goods, per the "APEGA Professional Practice Standard for Authenticating Professional Work Products."

b. Procurement of custom manufactured engineered goods (e.g., customized police/fire vehicles).

8. Templates, Forms, & Work Instructions

- "COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements" can be referenced when confirming the visual representation of a correctly *authenticated* and *validated PWP*.

9. Attachments

The following artifacts and specifies whether outputs are classified as *PWPs* requiring *authentication* and *validation*. This is not intended to be a complete list, but rather to document decisions already made and to be illustrative for future decisions:

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Attachment 9.1: Typical Output Authentication Requirements

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
City Auditor			
	None specific to Section identified		
Office of the City Manager			
	None specific to Section identified		
Community Services			
	None specific to Section identified		
City Operations			
Parks and Roads Services/Infrastructure Maintenance	Bridge and other civil/outdoor engineered structure inspection reports, repair instructions, or monitoring requirements.	Yes	When structure complexity, condition, and overall risk indicate requirement.
Parks and Roads Services/Infrastructure Maintenance	Re-opening of assets	Yes	Only required if the integrity of an engineered asset was in question.
Parks and Roads Services/Infrastructure Maintenance	Roadway and bridge Exception Load Permits	Yes	
Parks and Roads/Safe Mobility	Engineering designs for traffic calming measures for various Safe Mobility programs	Yes	
Parks and Roads/Safe Mobility	Speed limit assessment, especially for speed limit below 50 km/h	No (if it follows guidelines)	Follow COE-IM-GUIDE-0031 Posted Speed Limits Guidelines
Parks and Roads/Safe Mobility	Design exception memos	Yes	
Parks and Roads/Safe	40 km/h speed limit	Yes	

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Branch/ Section	Document Name/ Type	Authentication Required?	Notes
Mobility	signage installation		
Parks and Roads/Safe Mobility	Development of standards/guidelines	Yes	
Parks and Roads Services/Infrastructure Operations and Traffic Operations	Road and Walkway Lighting: Material and Construction Standard Road and Walkway Lighting Construction and Material Standards Road and Walkway Lighting Design Standards	Yes	
Parks and Roads Services/Traffic Operations	Speed limit assessments	Yes	
Parks and Roads Services/Traffic Operations	Traffic Signal Construction and Maintenance Specification	Yes	
Parks and Roads Services/Traffic Operations	Manual of temporary Traffic Control	Yes	
Parks and Roads Services/Traffic Operations	Temporary Traffic Accommodation Plans	Yes	If not following Manual of temporary Traffic Control
Parks and Roads Services/Traffic Operations	Temporary Traffic Accommodation Plans	No	Provided following the Manual of temporary Traffic Control
Fleet and Facility Services/Fleet Engineering	Fabrication Drawings (Fleet Services)	Yes	Engineered designs for Fabrication at *City* Fab Shop
Fleet and Facility Services/Fleet Engineering	Legislated Maintenance/Fire Apparatus – inspection reports	Yes	Some legislated equipment inspections require engineering certification
Fleet and Facility Services/Fleet Engineering	Engineering investigation reports	Yes	Equipment failure investigation reports and recommendations

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
Fleet and Facility Services/Fleet Engineering	Equipment certifications	Yes	Custom certifications, sometimes of existing equipment
Fleet and Facility Services/Fleet Engineering	*SOP*s, Safe Working Procedures, Memos, etc.	Yes	Technical Instruction documents used by the branch
Fleet and Facility Services/Acquisition and Disposal	Vehicle Weight cards (weight calculations)	Yes	Vehicle weight calculations for legislative compliance
Financial & Corporate Services			
	None specific to Section identified		
Integrated Infrastructure Services			
Infrastructure Planning and Design/Engineering Services	Geotechnical Investigation and Assessment Reports or Memos	Yes	Engineering *PWP*s regarding elements such as Foundation Engineering, Slope Stability Assessment, Roadway Subgrade Issues, Subsidence, etc.
Infrastructure Planning and Design/Engineering Services	Environmental Site Assessments, Environmental Overview Reports, Delineation reports, Groundwater Monitoring Reports	If prepared by *LP*, Yes	If prepared by *City LP*, yes. If prepared by professional under *APEGA*'s joint practice publications, *authenticated* by that certified registered professional in accordance with their regulatory standards
Infrastructure Planning and Design/Engineering Services	Remediation Reports/Remedial Action Plans	If prepared by *LP*, Yes	If prepared by *City LP*, yes. If prepared by professional under *APEGA*'s joint practice publications, *authenticated* by that certified registered professional in accordance with their regulatory standards
Infrastructure Planning and Design/Engineering Services	Soil Management Plans/Soil Quality Assessments/Soil Sampling Programs	If prepared by *LP*, Yes	If prepared by *City LP*, yes. If prepared by professional under *APEGA*'s joint practice publications, *authenticated* by that certified registered professional in accordance

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Branch/ Section	Document Name/ Type	Authentication Required?	Notes
			with their regulatory standards
Infrastructure Planning and Design/Engineering Services	Risk Management Plans for soil/groundwater contamination	If prepared by *LP*, Yes	If prepared by *City LP*, yes. If prepared by professional under *APEGA*'s joint practice publications, *authenticated* by that certified registered professional in accordance with their regulatory standards
Infrastructure Planning and Design/Engineering Services	Surface water quality monitoring, noise & environmental monitoring and data collection reports	No	Where these report data only, not analysis.
Infrastructure Planning and Design/Lifecycle Management	Building Condition Assessments	If prepared by *LP*, Yes	An architect or engineer registered in Alberta must *authenticate* according to respective regulatory standards
Infrastructure Planning and Design/Lifecycle Management	Energy Audit Reports	Yes	
Infrastructure Delivery/ Construction Materials Engineering and Testing	*Quality Assurance* (*QA*) Test Reports	No	*QA* test reports where testing has been completed in accordance with an accepted standard such as ASTM or AASHTO do not require *authentication*. Where testing has been completed according to a modified standard, *authentication* is required. Additionally, any analysis of test results does need to be *authenticated*.
Infrastructure Planning & Design/ Facility Planning & Design/Engineering Services	Facility Design and Construction Consultant Manual, Volume 2.	Yes	
Infrastructure Delivery/ Construction Materials	Pavement design	Yes	

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
Engineering and Testing			
Infrastructure Delivery/ Quality Assurance & Technical Services	Survey Reports	Yes	
LRT Expansion and Renewal / LRT Infrastructure Projects	LRT Design Guidelines	Yes	
Urban Planning & Economy			
Development Services/ Planning Coordination	Land Development and Construction - General Requirements Design and Construction Standards	Yes	
DCMO - Urban Planning and Economy /Urban Planning and Economy Strategy Team	Transportation models	Yes	
Fire Rescue Services			
Engineering	Infill Fire Protection Assessments ("IFPA")	Yes	
Edmonton Police Services			
	None specific to Section identified		
All Departments			
	Engineering or Geoscience Studies	Yes	
	Record Drawings	Yes	
	Repairs and modifications to existing infrastructures	Yes	
	Signage drawings	Yes	
	PEG Software functional descriptions	Yes	
	PEG Software verification reports	Yes	

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
	Reference Standard Design and Details	Yes	Details
	Professional memos	Yes	
	Technical Information (for procurement)	Yes	
	Fire Protection designs	Yes	
	Electrical/ Lighting/power service assessments/ ground fault/grounding designs	Yes	
	Heating/ cooling/ ventilation/ air conditioning (HVAC) designs/ upgrades	Yes	
	Mechanical feasibility studies	Yes	
	Stormwater Management/Drainage	Yes	
	Geophysical surveys (EM survey, ground penetrating radar survey, GPR survey)	Yes	

Attachment 9.2: Typical Outputs Not Requiring Authentication

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
All Departments			
	Commercial Documents, such as contracts	No	Any *technical information* contained in the commercial documents shall be removed as and a separate *PWP* and *authenticated* and *validated*.
	Preliminary or draft documents which are issued for review or comment	No	These documents must be clearly labelled as such.
	Documents prepared by others and submitted to the *City* for review/acceptance	No	These documents shall be *authenticated* by the originator, but not by *City LP*s. Care shall be taken not to advise or otherwise direct the design. The originator must retain full professional responsibility.
	Project status reports or other non-technical reports	No	
	Any document prepared by others, which has not been *thoroughly reviewed*	No	
	Any document for which the *LP* is not prepared to take professional responsibility	No	
	Inspection reports	No	Exception - structural inspections and bridge inspections.
	Emails or other general correspondence	No	Any *technical information* should be removed and added as an attachment which can be *authenticated* and *validated*.

Branch/ Section	Document Name/ Type	Authentication Required?	Notes
	Any document that does not contain engineering or geoscience content	No	

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City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Verification and Authentication Requirements for Engineering and Geoscience Software

Document #: COE-PEG-SOP-0007

Version: 02

Authorized By:

Nicole Wolfe	2022-02-11	
Name	*Date*	*Signature*

Director, Open Space Infrastructure Delivery & APEGA Permit Deputy COO
Title

VER	Date	Revision Summary	Author	Checked	Appv'd
02	2022-02-11	Minor Link, Table, and Definition Updates	Daryle Tilroe	David Clarke	Nicole Wolfe
01	2021-06-29	Original Issue	David Clarke	Daryle Tilroe	Nicole Wolfe

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Applicability

This *SOP* applies to all *software* that has been purchased, customized or developed by or for the *CoE* which incorporates or is used in the *practice of engineering or geoscience*.

Synopsis

This *SOP* provides a procedure to determine if engineering or geoscience *software* used by the *CoE* is classified as a *digital PWP* as defined by *APEGA*. The procedure further describes the requirements for *verification* and *authentication* of the *digital PWPs* as required by *APEGA*.

Revision Notes

- Link and Table updates
- New/Modified Definitions:
    - *Digital PWP*

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List of Evaluated Software Resources - Table 9

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1. Purpose

The purpose of this *SOP* is to ensure that all *software* used in the preparation of Engineering or Geoscience *PWPs* is complete and correct when applied as designed and to ensure that the *City* is meeting *APEGA* regulatory requirements.

2. Scope

This *SOP* applies to all *software* that has been purchased, customized or developed by or for the *CoE* which incorporates or is used in the *practice of engineering or geoscience*. For convenience there is an inventory of known and evaluated *software* in the 'List of Evaluated Software Resources - Table'.

3. References

- COE-PEG-SOP-0001 APEGA Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management Standard
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- APEGA Professional Practice Standard for Authenticating Professional Work Products v8.5 - January 2022
- APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing of Engineering and Geoscience v4.0 - May 2021

4. Definitions

Reference should be made to the *APEGA* Standards and Website Definitions for basic definitions and additional defined terms. Definitions included herein are for *City* specific applications, ease of reference or added clarity. These terms are italicized throughout the text. The definitions below are in addition to any listed in the "COE-PEG-SOP-0001 APEGA Professional Practice Management Plan", "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System", "COE-PEG-SOP-0004 Engineering & Geoscience Document Management Standard", and "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products". For convenience a COE-PEG-Defined Terms Dictionary is maintained.

4.1. *CoE Proprietary Software*

Software which has been created by or for the *CoE* by *LPs* which incorporates the *practice of engineering or geoscience*.

4.2. *Commercially Available Software*

Similar to *commercially engineered goods*, this is *commercially available software* for which there is public confidence that it has been designed by competent and qualified persons and prepared in compliance with recognized Canadian or international *regulations*, codes or specifications. *Commercially available software* is usually packaged with a complete user manual, specifications, and application instructions. If *commercially available software* requires configuration for conditions/assumptions or is used in a way that deviates from the published specifications, it becomes *customized software*.

4.3. *Customized Software*

Commercially available software which has been modified for use by a *LP* containing configuration parameters which are set through the *practice of engineering or geoscience* or is being used outside of its normal boundaries.

4.4. *Digital PWP*

Software in which its creation or modification by a *LP* requires the *practice of engineering or geoscience*. This would include both *customized software* and *CoE Proprietary Software*. The "APEGA Professional Practice Standard for Authenticating Professional Work Products" requires that all *digital PWP*s be *authenticated* and *validated* in an acceptable fashion.

4.5. Functional Specification

A document that describes how the *software* is intended to work. It describes both the expected inputs and the resultant outputs. Any assumptions and limitations are clearly described. *Functional specifications* come in many different forms. These may include: control philosophies and narratives, boolean logic diagrams, logic functional descriptions, cause-and-effect diagrams, Scientific Apparatus Makers Association (SAMA) diagrams and functional narratives.

4.6. Software

Software, in its most general sense, is a set of instructions or programs instructing a computer to do specific tasks. It includes computer programs that run on PCs, mobile phones, tablets or other smart devices.

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For the purposes of this *SOP*, we are referring specifically to *software* which incorporates the *practice of engineering or geoscience*. This can include purchased programs, spreadsheets, code, modelling or simulation programs (and their input/configuration files) or mobile device "apps".

4.7. *Verification Report*

A report which documents the *process* used and the results obtained to verify that the *software* works as intended.

5. Roles and Responsibilities

5.1. Document Administrator

The document administrator assigns and maintains a record of document numbers and revisions assigned to *functional specifications* and *verification reports*.

5.2. *Licensed Professional (LP)*

The *LP* prepares the *functional specification*, original *software* or modification thereof and the *verification* report either personally or under their direct supervision.

5.3. *Responsible Member (RM)*

RMs ensure that all *software* used within their areas of responsibility meet the requirements of this *SOP*. A list of all such *software* is maintained.

6. Procedure

The following procedure describes minimum requirements:

6.1. Classification

Determine if the *software* under consideration is a *digital PWP*. This can be determined by answering the following questions:

1. Is the *software* unmodified *commercially available software* as defined above?

   If yes, then it is not a *digital PWP* and only the requirements for *commercially available software,* as outlined below, apply.

2. Is the *software customized software* as defined above? If so, does the customization involve the *practice of engineering or geoscience*?

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If no, then no further requirements apply.

If yes, then the *software* is classified as a *digital PWP* and the requirements below apply to the customized portions. For the non customized portions, the requirements of *commercially available software* apply where appropriate.

For example, if the customization modifies the formatting of the resulting output, this does not involve the *practice of engineering or geoscience*, and the *software* is not a *digital PWP*.

If the customization involves modification of calculations, formulas, or configuration parameters to account for local conditions or modify assumptions then this likely does involve the *practice of engineering or geoscience*, and the requirements for a *digital PWP* apply.

3. Is the *software CoE proprietary software* as defined above?

   Confirm that the *software* incorporates the *practice of engineering and geoscience.* If not, the requirements of this *SOP* do not apply. If yes, then the *software* is a *digital PWPs* and the requirements outlined below apply.

   The remaining portions of this procedure apply to *digital PWPs* only.

6.2. Develop a *Functional Specification*

The *functional specification* shall clearly describe all aspects of the *digital PWP*. While the *functional specification* is generally prepared prior to the *digital PWP*, there may be cases where the *functional specification* documents the *PWP*, after the fact.

The *functional specification* is finalized as a *record document* after the *digital PWP* is completed, tested and put into service.

The *functional specification* is *verified*, *authenticated* and *validated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products".

6.3. Prepare the *Digital PWP*

The *digital PWP* is prepared by the *LP* or under their direct supervision.

6.4. Prepare a *Verification Report*

The *LP* prepares the *verification report* either personally or under their direct supervision. The *verification report* includes the *process* used to verify the *software*, the

test inputs, and the resultant outputs. The *verification process* shall be comprehensive in that all functions are thoroughly tested. Any errors or discrepancies shall be resolved.

The *verification report* is *verified*, *authenticated,* and *validated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication and Validation of Engineering & Geoscience Professional Work Products".

6.5. Management of Change

The *functional specification*, *Digital PWP,* and *verification report* are assigned a document number and revision number by the Document Administrator. Any modifications, additions, or deletions to the *Digital PWP* shall cause this *process* to be repeated.

7. Requirements

7.1. Commercially Available Software

The requirements for the procurement and deployment of *commercially available software* requires the exercise of *due diligence*. The following steps are required and should be fully documented where applicable:

a. Understand the functional requirements
b. Explore availability of *commercially available software* that meet the described functional requirements
c. Evaluate alternatives
d. Finalize the selection based upon an evaluation of both technical and commercial considerations
e. Document any limitations in the application of the *software*
f. Provide the necessary training to all end users
g. Maintain the deployment of the *software* at the latest available revision (where practical)
h. *Authenticate* any outputs, results, artifacts, etc. deemed to be *PWPs*.

7.2. *Digital PWP* Integrity and Security.

It is essential that the integrity of the *digital PWPs* be maintained. The following minimum requirements apply:

a. A revision is assigned to the *digital PWP*
b. A master copy of the *digital PWP* is kept in a secure location
c. The *digital PWP* is under password protection to protect from unauthorized changes

d. Any changes to *software* are made by authorized personnel only. Authorization of the *RM* is required. Changes shall follow the Management of Change procedure outlined above.

7.3. *Authenticating* the output

The output or results (eg. report, design, etc.) from any *software* which incorporates the *practice of engineering or geoscience* shall be *authenticated* where required by the "COE-PEG-SOP-0005 Verification, Authentication and Validation of Engineering & Geoscience Professional Work Products".

The *LP* is only taking professional responsibility that the *software* has been used in the manner intended by its *functional specification*, that the proper inputs have been checked and verified, and that the output has been checked for reasonableness and will also be used in the manner intended.

8. Templates & Forms

- None

9. Attachments

9.1. List of Evaluated *Software* Resources - Table

The following table lists *software* resources currently in use at the *City* which have been classified as a *Digital PWP*, have input configuration or programs that are *Digital PWPs*, or have been evaluated and do not involve a *Digital PWP* (but may or may not have results integrated into a PWP). This list is not meant to be exhaustive but can be used as a tool to identify *Digital PWPs* that need to be verified and *authenticated* and identify *software* resources used in the *CoE PEG Practice*. It is expected that as this *SOP* is revised this list will be continually confirmed and expanded.

Name of *Software*	Owner	Expectation
Spreadsheets	All	Assuming a spreadsheet meets the requirements of the *practice of engineering*, it depends on its intended audience, use, and persistence. If the spreadsheet is a "one off" to do analysis for a particular situation and used to inform a *PWP* (eg. report) then the spreadsheet is not a *Digital PWP*. If it is a model, analysis tool, etc. used by multiple *LP* and *non-LP* parties over time then it

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		will generally be considered a *Digital PWP*.
Central Traffic Management System	Traffic Operations (Traffic Signals & Streetlighting)	Commercial *Software* but programmed and configured for local traffic conditions. Programs are *Digital PWP*s and will be *authenticated* by *authenticating* the functional description and *verification report*.
Transportation Modelling	Transportation Systems Analytics	The models are not considered *Digital PWPs* as they are only created and used by *LPs* for creating individually *authenticated PWP* results.
Sampling System *Software*	IIS / Infrastructure Delivery / Technical Services – CMET	Configuration and output are not *Digital PWPs*. Output may be integrated into *PWPs*.
Weight distribution *software*, "Load Xpert"	*City* Operations / Fleet & Facility Services / Maintenance Planning & Engineering	Designs or instructions resulting from running the *software* model are the *PWPs,* not the model itself as it is under the control of an *LP*.
"Synchro" – timing design *software*.	Parks and Roads / Traffic Operations / Traffic Safety	The models are not considered *Digital PWPs* as they are only created and used by *LPs* for creating individually *authenticated PWP* results.
"CSI Bridge"	Infrastructure Maintenance	*Authenticate* and control the input models. Periodic *validation* reports of model results.

City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Record Documents and Redlines

Document #: COE-PEG-SOP-0008

Version: 02

Authorized By:

Nicole Wolfe	2022-02-11	
Name	*Date*	*Signature*

Director, Open Space Infrastructure Delivery & APEGA Permit Deputy COO
Title

VER	Date	Revision Summary	Author	Checked	Appv'd
02	2022-02-11	Modified and Moved Definitions	Daryle Tilroe	David Clarke	Nicole Wolfe
01	2021-04-23	Original Issue	David Clarke	Daryle Tilroe	Nicole Wolfe

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Applicability

This *SOP* applies to all project work carried out by the *City*, either internally or externally, which involves either the construction or modification of *City* assets based on the requirements of a *Professional Work Productackage (PWP)*. This *SOP* is applicable to both the engineering and geoscience professions.

Synopsis

This procedure covers the roles, responsibilities and practices for the preparation of *Record* and *Redline Drawings* and *Documents*, including requirements for *authentication, validation,* and retention.

Revision Notes

- New/Modified Definitions:
  - *Develop(er/ment) Redline(s)*
  - *Record Document/Drawing* deleted as it is defined in PEG-SOP-0005
  - *As-Built Document/Drawing* deleted as it is defined in PEG-SOP-0005

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1. Purpose

The purpose of this *SOP* is to define a clear and consistent procedure for *Redlines* and *Record Documents* to ensure uniformity across all project work carried out by or for the *CoE*. It is recognized that within individual Sections and projects additional requirements may be required, and these will be specified by that section or project.

The objective is to ensure that the *City* meets both regulatory requirements and industry best practices which together ensure the construction or modification of *City* assets are completed in accordance with the final *authenticated* and issued *Professional Work Products (PWPs)* and subsequent *FCNs*.

2. Scope

This *SOP* defines minimum requirements including consistent terminology, roles, responsibilities and practices required for the preparation of *Redline* and *Record Documents* following an overall procedure applicable to all. It provides guidance in determining if and how *Record Documents* are to be *authenticated*, and how copies are to be retained.

Detailed Work Instructions may be developed at the Section or project level to meet specific requirements.

3. References

- COE-PEG-SOP-0001 APEGA Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management Standard
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- COE-IM-GUIDE-0021 Land Development and Construction - Volume 1 - General Requirements
- APEGA Professional Practice Standard for Authenticating Professional Work Products v8.5 - January 2022

4. Definitions

Reference should be made to the *APEGA* Standards and Website Definitions for basic definitions and additional defined terms. Definitions included herein are for *City* specific applications, ease of reference, or added clarity. These terms are italicized throughout the text. The definitions below are in addition to any listed in the "COE-PEG-SOP-0001 APEGA Professional Practice Management Plan", "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System", and "COE-PEG-SOP-0005 Verification, Authentication, and

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Validation of Engineering & Geoscience Professional Work Products". For convenience a COE-PEG-Defined Terms Dictionary is maintained.

4.1. *Consequential Change*

Any change to a *PWP,* usually effected during *PWP Implementation,* that has a material effect on the integrity of the design and/or requires input and approval from the *authenticating Licensed Professional*.

4.2. *Construction Return*

Synonymous with *Redline Documents*. The term *Redline Document(s)* is used throughout this *SOP*.

4.3. *Engineer/Geoscientist of Record (EoR)*

Synonymous with *Authenticating Licensed Professional.* Not used.

4.4. *Field Change Request (FCR):*

A formal request from the *Project Manager* (or delegate) to the *authenticating LP* requesting a change to the issued *PWP*.

4.5. *Field Change Notice (FCN):*

A formal notification from the *authenticating LP* to the *PM* advising of a change to the issued *PWP*. The *FCN* shall be *authenticated* by the *LP*.

4.6. *PWP Implementation*

The process of, or completed, implementation or actualization of the *PWP* design requirements. This may refer to the construction of a new *City* owned asset, modification of an existing asset, programming and commissioning of new or modified *software* or execution of an engineered *work instruction*.

4.7. *Redline Document/Drawing (Redlines)*

A copy of an *authenticated PWP* which has been marked up to accurately document the *PWP Implementation*. Traditional *Redlines* are marked up in red. Other acceptable methods may include construction layers/overlays in a CAD drawing or 3D modelling software. These are also sometimes referred to as '*Construction Returns*'.

4.8. *Develop(er/ment) Redline(s)*

A particular type of *Consequential Change*, occurring prior to or during *PWP Implementation*, that the *City* Development Services has developed specific approval processes, requirements, and procedures around. This is fully articulated in

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"COE-IM-GUIDE-0021 Land Development and Construction - Volume 1 - General Requirements".

4.9. *Request for Information (RFI):*

A document or other form of communication from the *PM* to the *authenticating LP* requesting further information or clarification.

5. Roles and Responsibilities

5.1. *Project Manager (PM)*

PMs have overall accountability for a project. In the context of this *SOP*, this accountability specifically includes:

- managing the construction or other implementation of the project in accordance with the *PWPs;*
- verifying that the completed work is in accordance with the final design PWP and any subsequent *FCN*s;
- ensuring any changes are approved by the *authenticating LP;*
- ensuring *Redline Documents* are prepared and returned as required by this *SOP*.

Note that where the *PM* is referenced as responsible in this document, it is understood that many of these activities may be delegated to an appropriate designated party such as an external *consultant*/contractor or other internal resource.

5.2. *Licensed Professional (LP)*

LPs authenticate *PWPs* for which they are taking professional responsibility.

5.3. *Document Management Professional*

Manage the final version of all drawings and documents. File *PWPs*, *FCNs* and *Record Documents* according to the requirements of "COE-PEG-SOP-0004 Engineering & Geoscience Document Management Standard".

5.4. *Responsible Member (RM)*

RMs oversee the *quality management* of engineering and geoscience activities within their area of responsibility. *RMs* are required to validate *PWPs* prepared by *LPs* within their area of responsibility.

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6. Procedure

The procedural steps identified in the following subsections shall be undertaken, in accordance with the requirements of this *SOP*.

Reference should also be made to the flow diagram shown in the Attachment "Record Document Flow Chart".

6.1. Issue Final Design *PWP*

The final design *PWP* is issued by the Professional Engineer or Geoscientist. Depending on the project plan the final design *PWP* may be prepared by *City LPs* or by a *consultant* or contractor. *PWPs* shall be *authenticated* and *validated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products".

6.2. PWP Implementation

PWP implementation is completed in accordance with the final design *PWP*. Depending on the project plan, *PWP implementation* may be carried out by *City* employees, a construction contractor or other specialized contractor.

6.3. Management of Change

During *PWP Implementation* it is common to encounter situations where it is not possible or practical to follow the *PWP* exactly. This may occur for any of the following reasons:

- *PWP* requirements are not clear or sufficiently comprehensive;
- Field conditions are not as expected by the *PWP* and/or field fitting of the design is required;
- Supplied materials or equipment are not as expected;
- Material or equipment substitution is required, and;
- Operations is recommending changes to improve operability or maintainability.

In these situations (and others) the *PM* must decide if engineering or geoscience input is required. If the required change to the *PWP* is clear and *inconsequential* to the integrity of the design, the *PM* can proceed at their discretion. However, if there is doubt, or the change is *consequential* to the design, then the *authenticating LP* must be consulted.

The exact *process* should be defined in the project documentation and may depend on the parties involved and specific contractual requirements. In general, the *process* should be similar to the following:

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a) a *RFI*, or similar, is used to obtain clarification when the requirements are unclear. The *RFI* is sent from the *PM* to the *authenticating LP*. The *RFI* should follow the *process* required by the project, but must be documented in some way.

b) an *FCR*, or similar, is used to request a change to the *PWP*. The *FCR* is sent from the *PM* to the *authenticating LP*. The *FCR* should follow the *process* required by the project, but must be documented in some way.

c) an *FCN* may be issued by the *authenticating LP* to reflect changes to the *PWP*, prior to the *PWP* being updated. The *FCN* should follow the *process* required by the project, but must be *authenticated* by the *authenticating LP*.

d) The *authenticating LP* may reissue a revised *PWP* when deemed necessary. The *PWP* shall be *authenticated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products".

The *PM* is not authorized to make *consequential changes* without consulting with the *authenticating LP*, regardless of their professional qualifications.

Situations may occur where the *authenticating LP* is not available to respond to an *RFI* or *FCR* or to issue an *FCN* or revised *PWP*. Several possible scenarios exist however, all attempts should be made to have the original *authenticating LP* involved:

a) the *authenticating LP* is no longer employed by the *Permit* Holder (i.e. *City* or *Consultant*) or has been reassigned.

A new *LP* shall be assigned. They shall be given adequate time to thoroughly review the issued *PWP* so they are able to take full responsibility for any *FCNs* or *PWP* revisions.

b) The *Consultant's* contract scope of work does not include field support.

The *PM* needs to carefully consider this approach when establishing the Scope of Work for the *Consultant*. While this may allow some initial cost savings it may also introduce significant risk. Moreover, it must be recognized that appropriate engineering or geoscience practice typically includes a field inspection requirement. If changes are required to the *PWP*, then an *LP* needs to be assigned as a Field Engineer. This might be a *City LP* or an *LP* employed by the construction contractor. They shall be given adequate time to thoroughly review the issued *PWP* so they are able to take full responsibility for any *FCNs* or *PWP* revisions.

c) An urgent situation exists and the *authenticating LP* is temporarily unavailable.

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Refer to "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" for further guidance.

6.4. Verification

When the construction or implementation phase of the project is complete the *PM* shall verify that the *PWP implementation* is in accordance with the final design *PWP* and any subsequent *FCNs*.

If the discrepancies identified are not *consequential* to the design, then no further action is required. However, if the discrepancy is *consequential*, then the *authenticating LP* must be consulted. This can be done by issuing a *FCR* or similar document. The *LP* will either request that the work be redone to match the *PWP* or will authorize the change by issuing an updated *FCN* or *PWP*.

PMs may request an updated survey for new alignment and other *as-built* changes, if required.

PMs are not authorized to approve any *consequential changes* without consulting with the *authenticating LP and/or RM*, regardless of their professional qualifications.

6.5. Preparation of *Redline Documents*

The *PM* is accountable for the preparation of the *redline documents*. All changes made from the latest *PWP*, including any subsequent *FCNs*, during the implementation or *verification* phases of the project, shall be recorded on the *redline documents* by the *PM* or his delegate. If no changes were made, indicate "built per design".

The completed *redline documents* are to be signed and dated by the *PM*.

The following note is to be included:

> "This *redline document* has been prepared for *record* preparation purposes only. I certify that all information contained herein has been verified to the best of my ability. Any limitations have been duly noted."

The completed *redline documents* are then forwarded by the *PM* to the party designated to ensure the changes are reflected in the *Record Documents*.

6.6. Complete *Record Documents*

The *redline documents* received from the *PM* are integrated back into the final *record documents*. Depending on the project execution plan, this work may be completed by the *City*, by the *Consultant*, or a third party drafting service.

Any prior *LP authentication* stamps or *RM validation* stamps shall be removed.

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6.7. Authenticate Record Documents

Record Documents shall be *authenticated* when:

a) They contain *consequential changes to technical information* that were not present on previously authenticated *PWPs* or *FCNs;*

b) *City* requests *authentication* (reasons may include, but are not limited to, risk, complexity, etc.), or;

c) Other legal requirements apply.

If not *authenticated*, the *record documents* revision note shall clearly state: "Built per design and subsequent *FCNs*". *FCN* numbers shall be listed and submitted so as to demonstrate an authoritative chain of PWP *authentication* responsibility.

The *LP* can only *authenticate record documents* if one, or both, of the following are true:

a) The *LP*, or a competent individual supervised by the *LP*, was regularly present on site (adequate and frequent field reviews or continuous presence) and has personally inspected the completed work, or;

b) The *Redline Documents* have been marked up by a third party and incorporated into the final *Record Drawings*. The *LP* has thoroughly reviewed all the changes and is able to take professional responsibility.

If *authenticated*, a disclaimer, per Disclaimers Requirement, must be added to the drawing.

6.8. File & Retain *Record Documents*

File & retain in accordance with "COE-PEG-SOP-0004 Engineering & Geoscience Document Management Standard".

7. Requirements

The following additional minimum requirements shall apply:

7.1. Work Instructions

It is expected that more detailed work instructions will be developed to meet the needs of specific projects and Sections. Where applicable these work instructions shall be followed.

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7.2. Redline Documents

The project shall maintain a document control log to track issued drawings and documents and received *redline documents* to ensure all required documents are returned.

7.3. Disclaimers

The following disclaimer, or similar, should be placed on *record documents* that require *authentication*:

"*Authentication* by the *Licensed Professional* of this *record document* certifies that the design information contained herein accurately reflects the original design and the *consequential changes* made during implementation that were brought to the *Licensed Professional's* attention. These *record documents* are intended to incorporate addenda, change orders, and other *consequential changes*, but not necessarily all site instructions. The *Licensed Professional* does not warrant or guarantee, nor accept any responsibility for, the accuracy or completeness of the implementation information supplied by others contained herein, but does, by stamping and signing, certify that the information, if accurate and complete, provides an implemented system which substantially complies in all material respects with the original design intent."

Documents that are not *authenticated*, but are purported to be "Built per design", shall have the following disclaimer:

"These *record documents* have been prepared based on information provided by others. It is understood that implementation has been completed in accordance with final design and any subsequent instructions. The *Licensed Professional* has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omission which may be incorporated herein. Those relying on this *record document* are advised to obtain independent *verification* of its accuracy".

7.4. Drafting

Specific instructions for drafting of *As-built Documents* shall be provided in a *Work Instruction* prepared by the applicable project or section.

8. Attachments

- *Record Document* Flow Chart

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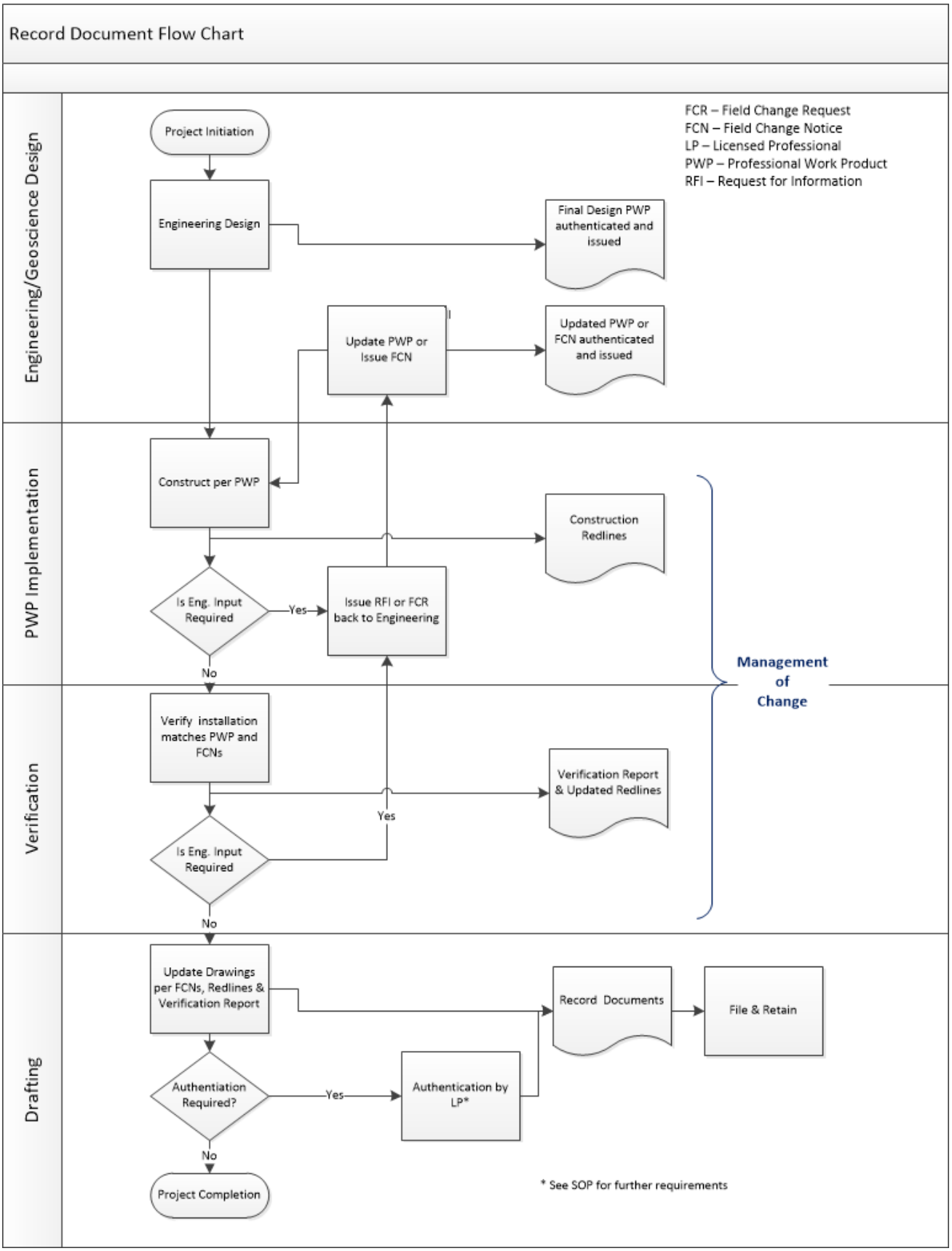
Record Document Flow Chart
Engineering/Geoscience Design
PWP Implementation
Verification
Drafting
FCR – Field Change Request
FCN – Field Change Notice
LP – Licensed Professional
PWP – Professional Work Product
RFI – Request for Information
Project Initiation
Engineering Design
Final Design PWP authenticated and issued
Update PWP or Issue FCN
Updated PWP or FCN authenticated and issued
Construct per PWP
Construction Redlines
Is Eng. Input Required
Yes
Issue RFI or FCR back to Engineering
No
Management of Change
Verify installation matches PWP and FCNs
Verification Report & Updated Redlines
Yes
Is Eng. Input Required
No
Update Drawings per FCNs, Redlines & Verification Report
Record Documents
File & Retain
Authentiation Required?
Yes
Authentication by LP*
No
Project Completion
* See SOP for further requirements

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City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Managing Consequential Changes and Record Documents

Document #: COE-PEG-SOP-0008

Version: 03

Authorized By:

Nicole Wolfe	2025-06-19	
Name	*Date*	*Signature*

A/Branch Manager Building Great Neighbourhoods & APEGA Senior Officer
Title

VER	Date	Revision Summary	Author	Checked	Appv'd
03	2025-06-19	This document has undergone major revision. Refer to "Revision Notes' for details.	Carla Wong	Daryle Tilroe	Nicole Wolfe
02	2022-02-11	Modified and Moved Definitions	Daryle Tilroe	David Clarke	Nicole Wolfe
01	2021-04-23	Original Issue	David Clarke	Daryle Tilroe	Nicole Wolfe

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Applicability

This *Standard Operating Procedure* (*SOP*) applies to all individuals carrying out *Professional Engineering and Geoscience* work involving either the construction of or modification of *City* assets. This includes internal work and *outsourced* work.

Synopsis

This *SOP* covers the roles, responsibilities, and practices for the management of change and preparation of *redline/as-builts and record documents/drawings*, including requirements for *authentication, validation,* and retention.

Revision Notes

Version 03 revision contains minor link updates, refined language for clarity and adherence to style guide. Major updates include:

- **Title** change from "Record Documents and Redlines" to "Managing Consequential Changes and Record Documents"
- **Applicability, Synopsis, Purpose and Scope** of the document revised to reflect managing consequential changes and the preparation and retention of as built and record documents
- Scope revised to apply to PEG work. Added the scope of this document does not include development redlines.
- **References:** added APEGA's bulletin for As-Built, Record, and As-Acquired Drawings, COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements, and APEGA's guideline on Field Reviews and COE-PEG-SOP-0009 (Outsourcing Requirements)
- **Definitions:** modified definition for consequential change, field change notice, Redline document/Drawing (and construction return to this definition), Develop(er/ment) redlines. Removed: Construction Return, EoR/GoR, PWP Implementation.
- **Roles & Responsibilities**:
    - To PM, added "Business Area Purchaser"; added "ensuring LPs are fulfilling field review recommendations and obligations" to second bullet; added "ensuring completion of relevant outsourcing forms as detailed in with "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements"; added "ensuring redline documents are prepared and returned as required by this SOP"
    - to LP, added "They also advise the Project Manager, when requested, to determine if a change is deemed a consequential change, requiring re-authentication and validation" added "Finally, LPs must perform all field reviews as deemed appropriate by best professional practice and any contractual or legislative requirements"
    - to Document Management Professional - changed to Document Management Administrator (to align with SOP-0004)
- **Procedure**: modified flow chart to follow text. Clarified "must" rather than "should" as requirements.
    - 6.1 Issue Final PWP: added APEGA's standard for authentication

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- 6.2 PWP Implementation: added field reviews and redline retention to PWP Implementation.
- 6.3 MOC becomes 6.2.1: clarified that FCNs may be change orders, change directives, or site instructions and must be authenticated if the change is a PWP; added field reviews where required and reference to APEGA's field review guideline; clarified MOC must be followed.
- 6.4 becomes 6.3 Confirmation: changed "verification" to "confirmation" to distinguish it from the defined term verification; added "this is primarily achieved by ensuring LPs have performed the recommended and/or required field reviews during the course of construction." removed. Removed "LP and/or RM" from authorizing changes, as RMs cannot authorize changes unless they are also the LP taking responsibility for the change. Removed "Project Managers PMs may request an updated survey for new alignment and other as-built changes, if required."
- 6.5 becomes 6.4 Prep of Redlines: clarified the PM is responsible for ensuring the redlines are collected, and not responsible for preparing the redlines themselves. Removed the requirement for redlines to be signed by the PM and related disclaimer as it is clear that redlines must contain all the changes to the design/change documents. Added reference to City's job aid on authentication and validation required.
- 6.6 becomes 6.5 Complete Record Docs: Added that record documents are informed by FCNs (change orders, change directives and site instructions.
- 6.7 becomes 6.6 Authenticate record Docs: clarified that record documents must be authenticated to comply with APEGA's bulletin (and added reference to bulletin). and their standard. Clarified disclaimer only applies to internally produced record drawings.
- 6.8 becomes 6.7 Authenticate redlines: substantially updated to reflect the requirements in APEGA's bulletin.
- 6.9 becomes 6.8: added "Technical Documents" to title and clarified PMs must submit technical docs to DMS Administrator

- **Requirements**
  - 7.2: changed title from Redline Documents to "Technical Documents and Deliverables"
  - 7.3: Disclaimers: clarified disclaimers must be added for internally produced deliverables. Admin changes to disclaimer. Per APEGA, record docs must be authenticated.
- **Attachments:** Updated flow chart to reflect changes

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1. Purpose

The purpose of this *Standard Operating Procedure* (*SOP*) is to establish a consistent process for creating, managing, and controlling changes to *technical documents,* including *Professional Work Products* (*PWPs*), *redline/as-built drawings/documents,* and *record drawings/documents* related to *Professional Engineering and Geoscience* (*PEG*) work carried out by or for the *City of Edmonton* (*City*). This *SOP* aims to ensure the effective management of *consequential changes* and that all *City* assets are constructed or modified in compliance with regulatory requirements and best practices. In addition, it outlines the minimum requirements for managing *redlines* and preparing, *authenticating*, and retaining *record documents*, which reflect changes and *Field Change Notices* (*FCNs*) to issued *PWPs*.

2. Scope

This *SOP* applies to all *PEG* work carried out by or for the *City*. It encompasses any work involving the construction of modification of *City* assets, whether performed internally or through *outsourced* contracts.

Detailed *Work Instructions* (*WIs*) may be developed at the Section or project level to meet specific needs, provided they align with the minimum requirements outlined in this *SOP.*

The scope of this document does not include *development redlines.*

3. References

- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements
- COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements
- COE-IM-GUIDE-0021 Land Development and Construction - Volume 1 - General Requirements
- APEGA Professional Practice Guideline on Field Reviews of Engineering and Geoscience Work
- APEGA Professional Practice Standard for Authenticating Professional Work Products

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- APEGA Professional Practice Bulletin Authenticating Requirements for As-Built, Record, and As-Acquired Drawings

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *Quality Management Systems* (*QMS*) documents, however, duplications may be included for ease of reference and added clarity. These terms are italicized throughout the text. For convenience a COE-PEG-Defined Terms Dictionary is maintained.

4.1. Consequential Change

Any change to a *Professional Work Product* (*PWP*), usually effected during *PWP* implementation, that has a material effect on the integrity of the design which requires input and *authentication* from the appropriate *Licensed Professional*.

4.2. Develop(er/ment) Redline

A particular type of change, occurring prior to or during *Professional Work Product* implementation, that the *City* Development Services has developed specific approval processes, requirements, and procedures around. This is defined in "COE-IM-GUIDE-0021 Land Development and Construction - Volume 1 - General Requirements."

4.3. Field Change Notice (FCN)

A formal notification from the *authenticating Licensed Professional* (*LP*) to the Project Manager advising of a change to the issued *Professional Work Product*. The *Field Change Notice* (*FCN*) must be *authenticated* by the *LP* if the change is a *consequential change*. *FCNs* can include multiple forms, such as change orders, change directives, or site instructions.

4.4. Field Change Request (FCR)

A formal request from the Project Manager (or delegate) to the *authenticating Licensed Professional* requesting a change to the issued *Professional Work Product*.

4.5. Redline Document/Drawing (Redlines)

A document/drawing that reflects the installed, fabricated, constructed, or commissioned condition of a *Professional Work Product* (*PWP*) and has typically been generated or marked up by someone other than the *Licensed Professional* who prepared the *PWP*. They are also called '*as-built documents/drawings*.' These drawings are intended to incorporate on-site conditions and any other construction coordination, refinement

or alteration not represented in the original *PWP.* [source: "APEGA Professional Practice Bulletin Authentication Requirements for As-built, Record, and As-Acquired Drawings"]. Traditional *redlines* are marked up in red. Other acceptable methods may include construction layers/overlays in a CAD drawing or 3D modelling software. These are also sometimes referred to as 'construction returns.'

4.6. Request for Information (RFI)

A document or other form of communication from the Project Manager to the *authenticating Licensed Professional* requesting further information or clarification.

5. Roles and Responsibilities

5.1. Project Manager (or Business Area Purchaser)

Project Managers have overall accountability for a project. If there is no Project Manager assigned, these accountabilities fall to the Business Area Purchaser. In the context of this *SOP*, this accountability includes:

- managing the construction or other implementation of the project in accordance with the *PWPs*
- confirming that the completed work is implemented in accordance with the final design *PWP* and any *FCN*s by ensuring *Licensed Professionals* (*LPs*) are fulfilling field review recommendations and obligations
- ensuring all *consequential changes* are *authenticated* by the appropriate *LP*
- ensuring completion of relevant *outsourcing* forms as detailed in with "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements"
- ensuring *redline documents* are prepared and returned as required by this *SOP*
- ensuring *record documents* are prepared and submitted to the *Document Management System* (*DMS*) *administrator* as required by this *SOP*

Note that where the Project Manager is referenced as responsible in this document, it is understood that many of these activities may be delegated to an appropriate designated party such as an external consultant/contractor or other internal resource.

5.2. Licensed Professional (LP)

LPs authenticate PWPs for which they are taking professional responsibility. They also advise the Project Manager, when requested, to determine if a change is deemed a *consequential change,* requiring re-*authentication* and *validation*. Finally, *LPs* must perform all field reviews as deemed appropriate by best professional practice and any contractual or legislative requirements.

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5.3. Document Management System Administrat(-ion/or)

Manage the final version of all drawings and documents. Files *PWPs*, *FCNs,* and *record documents* according to the requirements of "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

5.4. Responsible Member (RM)

RMs oversee the *QMS* involving engineering and geoscience activities within their area of responsibility. *RMs* are required to *validate* internal *PWPs* prepared by *LPs* within their area of oversight.

6. Procedure

The following steps must be undertaken; also refer to "Management of Change and Technical Document Flow Chart" attached:

6.1. Issue Final Design PWP

The final design *PWP* is issued by the professional engineer or geoscientist. Depending on the project plan, the final design *PWP* may be prepared by *City LPs* or by a consultant or contractor. *PWPs* must be *authenticated* and *validated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" (if produced internally) and the "APEGA Professional Practice Standard for Authenticating Professional Work Products" (in all cases).

6.2. PWP Implementation

PWP implementation is completed in accordance with the final design *PWP*. Depending on the project plan, *PWP* implementation may be carried out by *City* employees, construction contractors, or other specialized contractors. Regardless, the appropriate *LP(s)* or their designate(s) will perform all necessary field reviews, and the entity physically building the design must maintain appropriate *redlines* during the course of construction.

6.2.1. Management of Change

During *PWP* implementation, it is common to encounter situations where it is not possible or practical to follow the *PWP* exactly. Changes to the *PWP* may be necessary due to various factors, including:

- *PWP* requirements are not clear or sufficiently comprehensive
- field conditions are not as expected by the designer and/or field fitting of the design is required
- supplied materials or equipment are not as expected or not available

- material or equipment substitution is required
- operations recommends changes to improve operability or maintainability

In these situations (and others), the Project Manager must determine if engineering or geoscience input is required. If the required change to the *PWP* is clearly not a *consequential change* to the design, the Project Manager can proceed at their discretion. However, if there is doubt, or if the change is a *consequential change* to the *PWP*, then the *authenticating LP* must be consulted.

The exact management of change process must be defined in the project documentation and may depend on the parties involved and specific contractual requirements. In general, the process must ensure the following:

a) a *Request for Information* (*RFI)*, or similar, is used to obtain clarification when the requirements are unclear. The *RFI* is sent from the Project Manager to the *authenticating LP*. The *RFI* follows the process required by the project, but must be documented.

b) a *Field Change Request* (*FCR)*, or similar, is used to request a change to the *PWP*. The *FCR* is sent from the Project Manager to the *authenticating LP*. The *FCR* follows the process required by the project, but must be documented.

c) an *FCN* may be issued by the *authenticating LP* to reflect changes to the *PWP*, prior to the *PWP* being updated. The resulting *FCN* may be a change order, change directive, or site instruction and must be *authenticated*, per the "APEGA Professional Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings" if it constitutes a *PWP*. The *FCN* follows the process required by the project, but must be *authenticated* by the *authenticating LP* and *validated* by the *RM*.

d) The *authenticating LP* may reissue a revised *PWP* when deemed necessary. The *PWP* must be *authenticated* and *validated* in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" (for internally created *PWPs*) and the "APEGA Professional Practice Standard for Authenticating Professional Work Products" (in all cases).

The Project Manager is not authorized to make *consequential changes* without consulting with the *authenticating LP*, regardless of their professional qualifications.

Situations may occur where the *authenticating LP* is not available to respond to an *RFI* or *FCR* or to issue an *FCN* or revised *PWP*. Several possible scenarios exist, however, all attempts should be made to have the original *authenticating LP* involved:

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a) the *authenticating LP* is no longer employed by the *Permit Holder* (i.e., *City* or consultant) or has been reassigned.

   A new *LP* must be assigned. They must be given adequate time to conduct a *thorough review* of the issued *PWP* so they are able to take professional responsibility for any subsequent *FCNs* or *PWP* revisions.

b) The consultant's contract scope of work does not include field support.

   The Project Manager needs to carefully consider this approach when establishing the scope of work for the consultant. While this may allow some initial cost savings, it may also introduce significant risk. Moreover, it must be recognized that appropriate engineering or geoscience practice typically includes a field inspection or field review requirement. If changes are required to the *PWP*, then an *LP* needs to be assigned as a Field Engineer. This might be a *City LP* or an *LP* employed by the contractor. They must be given adequate time to conduct a *thorough review* of the issued *PWP* so they are able to take professional responsibility for any subsequent *FCNs* or *PWP* revisions. Refer to the "APEGA Professional Practice Guideline on Field Reviews of Engineering and Geoscience Work" for more information about field reviews during implementation or construction of *PWPs*.

c) An urgent situation exists and the *authenticating LP* is temporarily unavailable.

   Refer to "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" for further guidance.

6.3. Confirmation

When the construction or implementation phase of the project is complete the Project Manager must confirm that the *PWP* implementation is in accordance with the final design *PWP* and any subsequent *FCNs*. This is primarily achieved by ensuring *LPs* have performed the recommended and/or required field reviews during the course of construction.

If discrepancies identified are not deemed *consequential changes* to the design, then no further action is required. However, if discrepancies identified are deemed *consequential changes*, then the *authenticating LP* must be consulted. This can be done by issuing an *FCR* or similar document. The *LP* will either direct that the work be redone to match the *PWP* or will authorize the change by issuing an updated, *authenticated FCN* or *PWP*.

Project Managers are not permitted to authorize or direct any *consequential change* without consulting with the *authenticating LP*, regardless of their professional qualifications.

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6.4. Preparation of Redline Documents

The Project Manager is accountable for ensuring that the *redline documents* are prepared and submitted. All changes made from the latest *PWP*, including any subsequent *FCNs*, during the implementation or confirmation phases of the project, must be recorded on the *redline documents* by the contractor or other entity building the work. This enables the process of creating the final *record documents*. If no changes were made, the redlines must be marked "built per design."

The Project Manager must ensure that all *consequential changes* are properly *authenticated* and *validated* per "Job Aid for APEGA Authentication & Validation Requirements." The completed *redline documents,* complete with the relevant *authenticated FCNs,* are then forwarded by the Project Manager to the party designated to ensure the changes are reflected in the *record documents*.

6.5. Complete Record Documents

The *redline documents* and relevant *FCNs* received from the Project Manager are integrated back into the final *record documents* by the original *authenticating LP* (where possible). *Record documents* are prepared by an *LP w*ho may have issued changes through *FCNs* such as change orders, change directives, and site instructions. The changes must then be incorporated into one final set of *record documents.* Depending on the project execution plan, this work may be completed by the *City*, by the consultant, or a third party service.

Any prior *LP authentication* or *Responsible Member* (*RM*) *validation* must be removed.

6.6. Authenticate Record Documents

Record documents must be *authenticated* to comply with "APEGA Professional Practice Bulletin Authentication Requirements for As-built, Record, and As-Acquired Drawings" and "APEGA Practice Standard Authenticating Professional Work Products."

A disclaimer, per Disclaimers Requirement, must be added to *City* internally-produced *record documents*.

6.7. Authenticate Redline Documents

Typically, *LPs* do not *authenticate redline documents* because *consequential changes* should be captured through *authenticated FCNs* (change orders, change directives, site instructions) or modified *PWPs*. Refer to "APEGA Practice Bulletin Authentication Requirements for As-Built, Record, and As-Acquired Drawings" for information about when *redlines* must be *authenticated.*

6.8. File and Retain Technical Documents

The Project Manager must ensure all relevant *technical document*s, including *PWPs* and *record documents,* are submitted to the *DMS administrator* for filing in an appropriate *DMS* in accordance with "COE-PEG-SOP-0004 Engineering & Geoscience Document Management." Once complete, the *outsourcing* form (if applicable) must be completed to comply with "COE-PEG-SOP-0009 Engineering & Geoscience Outsourcing Requirements."

7. Requirements

The following additional minimum requirements apply:

7.1. Work Instructions (WI)

It is expected that more detailed *WIs* will be developed to meet the needs of specific projects and Sections, should they be required. Where applicable, these *WIs* must be followed.

7.2. Technical Documents and Deliverables

The Project Manager must maintain a document control log to track issued *technical documents*, including:

- *redline documents/drawings*
- *record documents/drawings*
- other related *project documents*/drawings
- *PWPs*
- *authenticated consequential changes,* such as *authenticated FCNs* (change orders, change directives, or site instructions)

Project Managers must also ensure all required documents are returned.

7.3. Disclaimers

The following disclaimer, or similar, must be placed on internally-produced *record documents*:

"*Authentication* by the *Licensed Professional* of this *record document* certifies that the design information contained herein accurately reflects the intent of the original design and the *consequential changes* made during implementation that were brought to the *Licensed Professional's* attention. These *record documents* are intended to incorporate all *consequential changes* to the *PWP* presented as addenda, change orders, change directives, and site instructions. The *Licensed Professional* does not warrant or guarantee, nor accept any responsibility for, the accuracy or completeness of the implementation information supplied by others contained herein, but does, by *authenticating*, certify that the information, if accurate and complete, provides an

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implemented system which substantially complies in all material respects with the original design intent."

7.4. Drafting

If necessary, specific instructions for drafting of *as-built/redline documents* must be provided in a *WI* prepared by the applicable project or Section.

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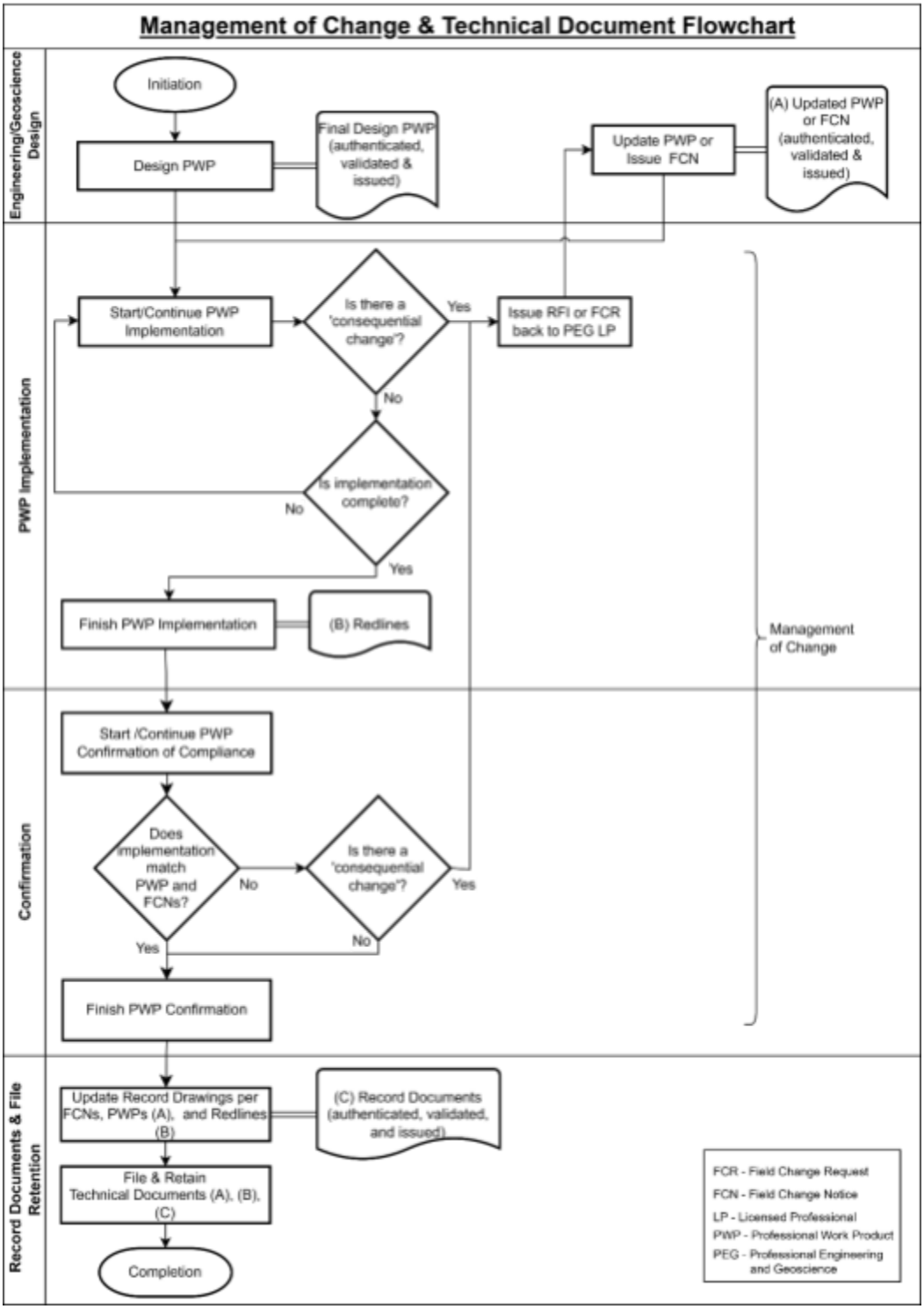
8. Attachments

- **Management of Change and Technical Document Flow Chart**



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Standard Operating Procedure

Engineering & Geoscience Outsourcing Requirements

Document #: COE-PEG-SOP-0009

Version: 03

Authorized By:

Nicole Wolfe	2025-01-08	
Name	*Date*	*Signature*

A/Branch Manager Building Great Neighbourhoods & APEGA Senior Officer
Title

VER	Date	Revision Summary	Author	Checked	Appv'd
03	2025-01-08	The document had undergone major revision. Refer to 'Revision Notes' for details.	CARLA WONG	DARYLE TILROE	NICOLE WOLFE
02	2022-02-14	Edits to 7.1.1 and 7.2.2 to clarify accountability and allow non *LP* delegated responsibility. COE-PEG-WI-0005 linked.	DARYLE TILROE	NICOLE WOLFE	NICOLE WOLFE
01	2022-02-11	Original Release	MARLIS FOTH	DARYLE TILROE	NICOLE WOLFE

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Applicability

This *Standard Operating Procedure* (*SOP*) applies to all individuals involved with *Professional Engineering and Geoscience* (*PEG*) work, particularly those *outsourcing professional services*. This *SOP* must be followed when the *City of Edmonton* (*City*) procures *professional services* directly through contracts or indirectly through subcontracts.

Synopsis

This *SOP* provides the minimum requirements when *outsourcing PEG* work for the *City.* It includes detailed procedures for procuring *professional services* and ensuring compliance with *APEGA's* standards. It outlines roles and responsibilities and describes the required *outsourcing* forms to facilitate a streamlined *outsourcing* process.

Revision Notes

The document has undergone a significant revision, incorporating updates to references, addition of new sections, restructuring and refined language for improved clarity and flow, modifications to existing sections and definitions, and new templates. Major updates include the introduction of three new outsourcing forms and the withdrawal of the existing outsourcing plan template 'COE-PEG-TMPL-0006 Engineering & Geoscience Outsourcing Plan Template' and existing outsourcing checklist 'COE-PEG-FORM-0001 Checklist for Outsourcing Professional Engineering and Geoscience Services to and APEGA Licensed Entity.' These forms address the APEGA requirements of both an outsourcing plan (when outsourcing to a non-APEGA entity) and outsourcing process (when outsourcing an APEGA entity).

- COE-PEG-FORM-0002 PEG Outsourcing Form - Standalone Contracts for PEG Services
- COE-PEG-FORM-0003 PEG Outsourcing Form - Standing Arrangement for PEG Services
- COE-PEG-FORM-0004 PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services

For detailed revision notes, please contact apegabsa@edmonton.ca.

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1. Purpose

This *Standard Operating Procedure* (*SOP*) outlines the procedures and requirements that must be followed and met when procuring *professional services* related to the practices of *Professional Engineering and Geoscience* (*PEG*) as per the "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing."

2. Scope

This *SOP* applies when the *City of Edmonton* (*City*) procures *engineering and geoscience professional services.* This includes instances that result in a *Professional Work Product* (*PWP*). This *SOP* must be followed with every individual contract award, including subsequent *call-up* orders thereunder as applicable.

3. References

- The Engineering and Geoscience Professions Act of Alberta
- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0004 Engineering & Geoscience Document Management
- COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products
- COE-PEG-SOP-0008 Record Documents and Redlines
- COE-PEG-SOP-0011 Non-Conformance Process
- COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements
- COE-PEG-FORM-0002 PEG Outsourcing Form - Standalone Contracts for PEG Services
- COE-PEG-FORM-0003 PEG Outsourcing Form - Standing Arrangement for PEG Services
- COE-PEG-FORM-0004 PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services
- COE-PEG-TMPL-0012 PEG Outsourcing Interface Management Process Template
- COE-PEG-FORM-0005 PEG Professional Practice Management Plan Review Form
- APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing

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- APEGA Professional Practice Standard for Authenticating Professional Work Products
- APEGA Permit Holder and Member Directory
- APEGA Professional Practice Standard Professional Practice Management Plan
- City Standard - Project Management for Capital Projects
- Glossary: Procurement & Contract Management
- Procurement and Contract Risk Assessment (PACRA) Form
- City CPSS Buyer List
- Procurement Standard - The City of Edmonton
- City Administrative Policy A1205 - Contract Management
- APEGA & ASET Professional Members Directory
- Practical Definitions for Engineering and Geoscience Professional Services
- Description of Work (DOW) Instructions

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *Quality Management System* (*QMS*) documents, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained. For this *SOP*, please also reference "Glossary: Procurement & Contract Management."

4.1. APEGA

The Association of Professional Engineers and Geoscientists of Alberta (*APEGA*) which regulates the *practices of engineering and geoscience* in Alberta on behalf of the Government of Alberta through the *Engineering and Geoscience Professions Act* and *General Regulation*. [Source: COE-PEG-SOP-0001]

4.2. Call-Up

A *call-up* is the process for asking the *standing arrangement* consultants to submit bids or proposals under a *standing arrangement.* A *call-up* assignment is the scope of work, and a *call-up* order (or agreement) is the contract issued with respect to a specific batch

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of work the *City* intends to assign a consultant as part of a *standing arrangement.*

4.3. Description of Work (DOW)

For the purposes of this document, the *Description of Work* (sometimes referred to as scope of work) refers specifically to the detailed outline of *Professional Engineering and Geoscience* services required for a *City* project, encompassing the necessary tasks, deliverables, and expected professional outcomes.

4.4. Engineering and Geoscience Professions Act (EGP Act)

The legislation that governs the *practices of engineering and geoscience* in Alberta: "*The Engineering and Geoscience of Professions Act of Alberta*." [Source: COE-PEG-SOP-0001]

4.5. Outsourc(e/ed/ing)

Procuring *professional services* from an individual or entity not practising under the *outsourcing entity's Permit(s) to Practice*. This includes when a sole proprietor procures *professional service*s. Unless otherwise contextualized, this refers to the specific case of the *City* as the *outsourcing entity*. [source: "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing"]. [Source: COE-PEG-SOP-0001]

4.6. Outsourced Entity

The *APEGA Licensed Professional, Permit Holder*, or an entity not licensed by *APEGA* that provides *professional services* to an *outsourcing entity*. [source: "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing"]. [Source: COE-PEG-SOP-0001]

4.7. Outsourcing Entity

The *APEGA Permit Holder* or *Licensed Professional* that is procuring *professional services*. An *outsourcing entity* procures *professional services* from an *outsourced entity*. [source: "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing"]. [Source: COE-PEG-SOP-0001]

4.8. Practice of Engineering

As defined in Section 1(q) of the *Engineering and Geoscience Professions Act*:

> Reporting on, advising on, evaluating, designing, preparing plans and specifications for or directing the construction, technical inspection, maintenance or operation of any structure, work or process

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(A) that is aimed at the discovery, development or utilization of matter, materials or energy or in any other way designed for the use and convenience of humans, and

(B) that requires in that reporting, advising, evaluating, designing, preparation or direction the professional application of the principles of mathematics, chemistry, physics or any related applied subject.

Also, but with specified scope, for *Professional Technologists* (*P.Techs.*) under Section 86.4(m). [Source: COE-PEG-SOP-0001]

4.9. Practice of Geoscience

As defined in Section 1(r) of the *Engineering and Geoscience Professions Act*.

Reporting, advising, evaluating, interpreting, processing, geoscientific surveying, exploring, classifying reserves or examining related to any activity

(A) that relates to the earth sciences or the environment,

(B) that is aimed at the discovery or development of oil, natural gas, coal, metallic or non-metallic minerals, precious stones, other natural resources or water or that is aimed at the investigation of surface or subsurface conditions of the earth, and

(C) that requires, in that reporting, advising, evaluating, interpreting, processing, geoscientific surveying, exploring, classifying reserves or examining, the professional application of the principles of mathematics, chemistry, physics or biology through the application of the principles of geoscience.

Also, but with specified scope, for *Professional Technologists* (*P.Techs.*) under Section 86.4(m). [Source: COE-PEG-SOP-0001]

4.10. Professional Services

When used in *Quality Management System* documents, services that involve the *practices of engineering or geoscience*. The products generated from *professional services* are called outputs. [source: "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing"]. [Source: COE-PEG-SOP-0001]

4.11. Professional Work Product (PWP)

An output or artifact of a *professional service* that requires *authentication* and *validation*. Defined in the *General Regulation* as "...plans, specifications, reports, or documents of a professional nature," a *Professional Work Product* (*PWP*) is any output from *Professional Engineering and Geoscience* practice that meets all of the *authentication* test criteria

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defined in "APEGA Professional Practice Standard for Authenticating Professional Work Products." A *PWP* can be physical (e.g., paper, plastic film), electronic (e.g., electronic document, image), or digital (e.g., software, modelling, simulation, or any other computer application that cannot be reproduced in a physical or electronic format). See the *authentication* test in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" when assessing whether an output is a *PWP*. [Source: COE-PEG-SOP-0001]

4.12. Standing Arrangement

A type of arrangement between the *City* and one or more suppliers, under which the *City* may acquire the supply of goods or performance of services or construction from the suppliers over the term of the contract. The arrangement includes all terms applicable to the procurement, such as the cost of the good or service and delivery requirements. These have been previously known as 'open orders' or 'outline agreements.'

5. Roles and Responsibilities

5.1. Business Area Purchasers / Project Managers

This individual, who may or may not be a *Licensed Professional* (*LP*), is accountable to clearly understand the goods, services, or construction being purchased and if they fall under the *practice of engineering or geoscience.*

If the procurement or part of it falls under the practices, Project Managers are accountable for completing the required *outsourcing* form as defined in this *SOP,* and for retaining the completed form with the project documentation. If a Project Manager is not assigned, the accountability rests with the Business Area Purchaser, as defined in the "Procurement Standard - The City of Edmonton" as "an employee responsible for completing a purchase on behalf of the *City*," and not a Corporate Procurement and Supply Services (CPSS) buyer, such as the Contract or Standing Arrangement Manager.

5.2. Contract Manager

Defined in the "City Administrative Policy A1205 - Contract Management," their role is to manage the technical and administrative aspects of contracts, including amendments and renewals throughout the life of the contract. Includes Standing Arrangement Contract Managers.

5.3. Corporate Procurement and Supply Services (CPSS) Buyers

Responsible for ensuring procurement involving the *practices of engineering and geoscience* meet the requirements of this document by working with the Business Area Purchaser/Project Manager.

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5.4. Licensed Professionals (LPs)

City LP responsible for reviewing *professional services* procurements and providing advice or guidance to the Business Area Purchaser/Project Manager regarding *outsourcing* requirements, particularly in the review of the *PEG Description of Work* (*DOW*), selection of the *outsourced entity*, *authentication*, *validation*, and the determination of *consequential changes*.

5.5. Members-in-Training (M.I.T.s)

Responsible for including their *RM* and *City LPs* on projects they are involved with to ensure *outsourcing* requirements are met.

5.6. PEG Practice Office

Responsible for providing assistance and training to help Business Area Purchasers, Project Managers, and *LPs* meet *outsourcing* requirements. Additionally, responsible for reviewing *Professional Practice Management Plans* (*PPMPs*) collected by Business Area Purchasers, Project Managers, or CPSS to ensure they contain adequate and acceptable processes, in alignment with "APEGA Professional Practice Standard for Relying on Work of Others and Outsourcing" and the "APEGA Professional Practice Standard Professional Practice Management Plan."

5.7. Responsible Members (RMs)

Responsible for providing oversight in the business area to ensure those procuring *PEG* services are aware of and accountable to meet the requirements in this *SOP*. They are responsible for ensuring appropriate *LPs* are assigned to provide assistance and for providing support to the Business Area Purchaser/Project Manager.

5.8. Senior Officer (SO)

Ensures that *LPs*, Business Area Purchasers, and Project Managers have established procedures and receive the necessary training to carry out their responsibilities related to *outsourcing.*

6. Procedure

Professional services procurement completed by the *City* is primarily handled through the CPSS Branch. Information regarding procurement processes can be found on OneCity - Procurement & Contracting, OneCity - Outsourcing of Engineering and Geoscience Services: APEGA and the CPSS Procurement and Contract Management Training and Reference Material Google Site. The general procurement process for the *City* is shown here.

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The procedural steps identified in the following subsections must be performed, in accordance with the requirements of this *SOP*, by the *City* Business Area Purchaser or Project Manager requesting the procurement of the *professional service.*

6.1. Determination of Professional Services Components

As part of the procurement process, the Business Area Purchaser or Project Manager is required to fill out the "Procurement and Contract Risk Assessment (PACRA) Form" to initiate a procurement with CPSS. Questions will be asked to determine if the scope of work contains *professional services*. Alternatively, for some values of procurements, the controlled items list is used. When there are engineering or geoscience *professional services* components identified, either the PACRA form or the controlled items list will trigger specific requirements and items to be included in the contracts as highlighted in the 'Section 8.3.'

Not all *PEG* procurements go through CPSS; some *call-up orders*, depending on their value, are handled by the Business Area only.

Detailed Practical Definitions for Engineering and Geoscience Professional Services, along with examples, have been established to assist Business Area Purchasers and Project Managers in determining whether a service meets the criteria of a *professional service*. If further help is needed, contact the business area's *RM* or the *PEG Practice Office at* apegabsa@edmonton.ca to help determine whether a service meets the criteria for an engineering or geoscience *professional service*.

6.2. Planning the Procurement of Professional Services

Contracts may be established through various procurement methods, including competitive and non-competitive processes. They may be standalone or formed using *standing arrangements* or pre-qualification lists. *Due diligence* must be exercised throughout this process to ensure that the *professional service* or *Professional Work Products* (*PWPs*) planned for procurement meets the *outsourcing* requirements outlined in this *SOP*.

To do this effectively, a *DOW* is required, along with consideration of various items from prospective suppliers and their subconsultants, such as considering their *APEGA* licensure status, professional reputation, requests for *PPMPs*, and demonstrated experience.

Regardless of the procurement method selected, provisions for regulatory *outsourcing* requirements (identified in 'Section 7' and 'Section 8') must be considered **before** selecting *outsourced entities*. During this planning phase, Business Area Purchasers/Project Managers and CPSS buyers ensure provisions are in place to meet regulatory requirements before contracts are awarded, executed, or before suppliers are prequalified.

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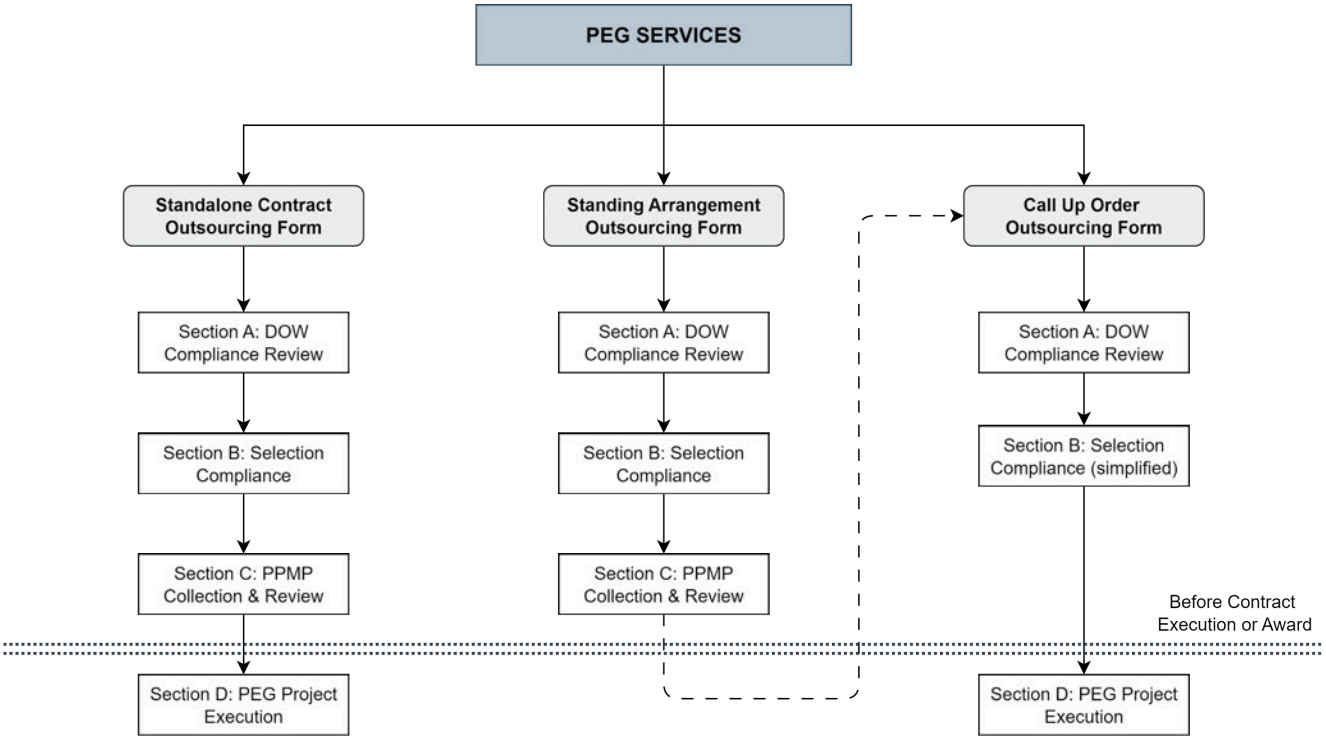
There are three main scenarios, each with its own *outsourcing* form, to be substantially completed by the Business Area Purchaser/Project Manager **before** awarding or executing contracts. Only one form needs to be completed (see Figure 6.2):

Figure 6.2: PEG Services - Outsourcing Forms



6.2.1. PEG Outsourcing Form - Standalone Contracts for PEG services

a. Use when developing standalone contracts for *PEG* services or when standalone contracts may include future *PEG* services

6.2.2. PEG Outsourcing Form - Standing Arrangements for PEG Services

a. Use when developing *standing arrangements* for *PEG* services or when future *call-up* orders may contain *PEG* services (i.e., for architectural services where *call-up* orders contain *PEG* services)
b. Use before selecting preferred suppliers, such as when creating a prequalification list

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6.2.3. PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services

a. Use for developing *call-ups* issued under *standing arrangements* in '6.2.2' above, provided the *outsourcing* requirements for the *standing arrangement* were met
b. Do not use it when developing *call-ups* under *standing arrangements* where *outsourcing* requirements were previously not met. Contact the *PEG Practice Office* in these cases

6.3. Executing Projects with Professional Services

Once the *outsourced entities* are selected, formal contracts are entered.

During contract execution, the Business Area Purchaser/Project Manager remains accountable to complete the applicable *outsourcing* form defined in 'Section 6.2' above, ensuring *professional services* deliverables, including *PWPs* and *consequential changes* affecting *PWPs,* meet the requirements identified in 'Section 8.5.'

6.4. Completing Projects with Professional Services

Once the engineering and geoscience scope of work for the projects has been completed, the *outsourcing* forms described in 'Section 6.2' are retained in a folder within the project documentation labeled '*outsourcing*.'

6.5. Oversight of Outsourcing Process

The *City* is required to provide oversight of the engineering or geoscience aspects of the *outsourcing* process to ensure requirements are met.

To do this effectively, a *City APEGA LP* is assigned at various stages. The Business Area Purchaser/Project Manager must identify the Business Area *RM* (refer to the internal "APEGA & ASET Professional Members Directory"), who can assist in selecting an appropriate *City APEGA LP.* The *LP* is tasked with ensuring that their specific responsibilities outlined in this *SOP* are met. In some cases, the *RM* may delegate this responsibility to another *LP*. While the *LP* and the *RM* provide oversight and support, the Business Area Purchaser/Project Managers remain accountable for fulfilling the overall *outsourcing* requirements.

RMs and *LPs* must ensure sufficient and appropriate *LPs* are selected, particularly to review the *DOW* and to help answer questions the Business Area Purchaser/Project Manager may have.

The Business Area Purchaser/Project Manager also must ensure that the *outsourced entity* is following all required processes throughout the duration of the contract and providing the deliverables as clearly defined in the contract and *DOW*.

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6.6. Non Compliance in Outsourcing Processes

As outlined in "COE-PEG-SOP-0011 Non-Conformance Process," the *PEG Practice Office* will issue *non-conformance* reports to Business Area *RMs* if *outsourcing* requirements are not met. These may arise from various sources including *internal practice reviews*, regulatory practice reviews or inquiries, and other sources. The Business area *RM* is responsible for working with the Business Area Purchaser/Project Manager to resolve *non-conformances* and to implement *corrective actions.*

7. General Requirements

7.1. Outsourcing to Entities Licensed by APEGA vs Entities not Licensed by APEGA

APEGA has two sets of requirements, depending on the *outsourced entity's* licensure status. To address both sets of requirements, the *City* uses the same *outsourcing* process when *outsourcing professional services*, regardless of whether or not the *outsourced entity* is licensed with *APEGA*. In both cases:

- an *outsourcing* form consisting of a series of sections must be completed by *City* Business Area Purchasers/Project Managers each time a *professional service* is procured. Refer to 'Section 6.2' for information about the forms.
- these forms meet the requirements in "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing," Sections 4 and 5
    - in cases where the *City* contracts to entities not licensed with *APEGA*, the form results in an *outsourcing plan*
    - in cases where the *City* contracts to entities licensed by *APEGA*, the form provides evidence that the *outsourcing* process requirements are met
- the completed form must be kept with the project documentation for each project in an '*outsourcing*' folder created by the Business Area Purchaser/Project Manager

The *City* has streamlined its *outsourcing* process by using a single set of forms to address both *APEGA's* requirements for *outsourcing* to licensed and non-licensed entities. This approach simplifies the overall process, ensuring consistency and efficiency, while still meeting all of *APEGA's* requirements. It eliminates the need for separate processes depending on bidders' status, reducing confusion and potential errors. By consolidating the process, the *City* can more effectively manage its *professional services* procurements and maintain compliance with regulatory standards.

7.2. Overlapping Areas of Practice

For *outsourcing* services in overlapping practice as described in "COE-PEG-SOP-0001 Professional Practice Management Plan," the *RM* or *LP* may select and assign a

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professional from one of the recognized professions to oversee the requirements in this *SOP* are met.

If, after review of the *DOW*, it is deemed that another recognized professional will perform the work, then the requirements of this *SOP* do not apply. However, *due diligence* must still be undertaken and documented to eliminate potential gaps. To ensure this the Business Area Purchaser/Project Manager must complete Section A in the appropriate *outsourcing* form, indicating the work falls within overlapping practice, and will be performed by another professional recognized in *APEGA's* standards. They then must ensure the following requirements are met in their process:

- Confirmation that the work falls within the scope of overlapping practice
- Documented *due diligence*, including:
  - verification of relevant professional qualifications and experience
  - consultation with internal subject matter experts, if needed
  - confirmation of compliance with the regulatory requirements of the professionals' governing body
- Involvement of a Qualified Professional: A *City APEGA LP* (or other recognized professional, as appropriate) must review and sign off on the due diligence documentation.

If *Permit Holders* or *LPs* are selected to complete the work, then this *SOP* applies and the applicable *outsourcing* form(s) described in 'Section 6.2' must be completed. Overlapping practice is a special case, and as long as the requirements are met, the *Practice Office* may approve alternative methods.

7.3. Retainer of Experts for Legal Purposes

When hiring engineering or geoscience experts for legal matters, two distinct scenarios are possible: (1) when the expert's role is to provide an opinion solely for legal purposes, this is handled by Legal Services and does not fall under the requirements here for *outsourcing professional services*. This is privileged information and the court decides what constitutes an expert. (2) However, when the expert's role involves or partially involves problem-solving or addressing engineering or geoscience issues with the intent to implement the engineering or geoscience advice, then the *outsourcing* requirements defined in this *SOP* must be met. The distinction is in scenario (1), the practice is not included in the *City's* practice of engineering or geoscience, whereas in Scenario (2), it is. In scenario (1), it is strongly recommended to seek input early from the most appropriate internal *City* engineering or geoscience professionals to ensure the appropriate expert is selected; scenario (2) requires engineering or geoscience involvement. Legal Services must enter the agreement in scenario (1) ("Procurement Standard - The City of Edmonton," Appendix 7). Seeking legal advice regarding the agreement in scenario (2), and whether it can be used for legal purposes, is strongly recommended.

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7.4. Subsequent Outsourcing or Delegated Design

The *professional service* contracts contain clauses that require the *outsourced entity* to request approval before introducing new subconsultants.

If the *outsourced entity* is a *Permit Holder* and subsequently *outsources* to another *professional service* provider, either as a new subconsultant or as part of delegated design, they must follow their own documented *outsourcing* process defined in their respective *PPMP*. In these cases, the Business Area Purchaser/Project Manager is not required to be involved with selecting the subconsultant, as long as the subconsultant is registered with active status with *APEGA*. However, any other contractual obligations outside of this *PEG outsourcing* process must still be fulfilled.

If the *outsourced entity* is a not a *Permit Holder* and subsequently *outsources* to another *professional service* provider—whether as a new subconsultant or part of delegated design—the Business Area Purchaser/Project Manager must have the *outsourced entity* provide their subconsultant's *PPMP(s)* or relevant portions and included it in the appropriate *outsourcing* form. The *PPMP* must then be reviewed by the *PEG Practice Office.* Additionally, a *City APEGA LP* must be involved before approving the subconsultant to ensure compliance with the requirements in 'Section 8.3' of this *SOP* are met. The *outsourced entity* must provide evidence that their service provider has:

- experience delivering similar *professional services*
- active *APEGA* licensure status, and
- an acceptable professional reputation

Lastly, all *PWPs* produced by the *professional service* provider(s) in both cases above must be checked upon submission during project execution to ensure proper *authentication* and *validation* (see 'Section 8.5').

7.5. Taking Professional Responsibility for Work Prepared by Others

The *City* typically requires all *outsourced professional services* be *authenticated* and *validated* by an external *APEGA LP* and *Permit Holder*.

In the extremely rare and highly discouraged instance when the *outsourced entity* is not licensed by *APEGA* and a *City LP* takes professional responsibility by *authenticating* and *validating PWPs* created by others, the *City* must meet all applicable requirements as specified in "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products" and "APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing." Appropriate documentation of *due diligence* is required. The *LP* should use their professional judgment to advise the Business Area Purchaser/Project Manager what documentation

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is required specific to a project. The *LP* must also reference "COE-PEG-SOP-0004 Engineering & Geoscience Document Management."

7.6. Contract Templates

Formal contracts are required for all projects containing *professional services* (i.e., purchase orders alone are not sufficient). This includes all contracts that may potentially include *professional services.* CPSS and Legal Services maintain contract templates that must be used when procuring engineering and geoscience services, which includes specific *PEG* clauses. Copies of previous contracts must not be used as templates, as terms and conditions are subject to change. Business Area Purchasers/Project Managers may continue to use standard *DOW* or Specification templates developed for their areas where appropriate, provided the required *PEG* wording described in 'Section 8.2' is included and it is verified that there are no conflicts with newest terms and conditions. Current templates can be found in the Ariba Contract Template folder. If non-standard templates are used, including in scenarios where the *City* uses terms and conditions provided by others, a Legal Services solicitor must be involved.

Currently, the following templates contain the required *PEG* clauses:

- Construction Design Bid Build
- Construction Manager-at-Risk
- Construction Consultant General Contractor
- Professional Services (most common)
- Integrated Project Delivery
- Progressive Design Build (future)
- Traditional Design Build (future)

If a different template is used to procure *PEG* services, such as the Goods and Services or Goods templates, please work with Legal Services to ensure the *PEG* clauses are included.

8. Outsourcing Forms Requirements

Once it has been determined that *professional services* will be part of a procurement, whether directly or indirectly, there are specific requirements that must be included as part of the *outsourcing* process.

The *outsourcing* forms described in 'Section 6.2' provide instructions and sections tailored to the form selected, guiding the Business Area Purchaser/Project Manager through completion. An *outsourcing* form must be substantially completed each time a *PEG* service is procured, before contracts are awarded or executed, and saved in a project documentation folder labeled '*outsourcing*.' The Business Area Purchaser/Project Manager must be able to locate and submit this form if the *PEG Practice Office* requests it.

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The forms are living documents until the project's engineering or geoscience work is complete, and may require periodic updates. Business Area Purchasers/Project Managers are accountable[1] for completing all sections in each form unless otherwise noted, as described in 'Section 5.2.' Table 8.1 provides a summary of the sections included in each *outsourcing* form.

Detailed requirements for each section are included in each *outsourcing* form. However, the purpose of each form, along with general requirements and fields requiring additional guidance are outlined below.

Table 8.1: Outsourcing Form Summary

***Outsourcing* Forms:**	Project Information & Personnel Assignment	**Section A**: DOW Compliance Review	**Section B**: Selection Compliance Review	**Section C**: *PPMP* Collection & *PPMP* Review	**Section D**: Contract Execution for *PEG* Work
Standalone Contracts for *PEG* Services	✔	✔	✔	✔	✔
Standing Arrangements for *PEG* Services	✔	✔	✔	✔	
Call-ups under *Standing Arrangements* for *PEG* Services	✔	✔	✔ (simplified)		✔

8.1. Project Information and Personnel Assignment

Each form contains a field for Project Information and Personnel Assignment. Personnel Assignment varies from section to section within a form but typically identify one or more of the following:

- The Project Manager/Business Area Purchaser
- The Business Area *RM*
- The *City APEGA LP*
- The CPSS Buyer

The Business Area Purchaser/Project Manager can find *RMs* and *APEGA LPs* using the internal "APEGA & ASET Professional Members Directory." The *RM*, or a *City APEGA LP* they designate, must assist the Business Area Purchaser/Project Manager to select an appropriate *City APEGA LP* if needed. The CPSS Buyer can be selected from this "City CPSS Buyer list."

[1] The RACI chart in 'Section 10' defines the Responsible/Accountable/Consulted/Informed roles for form completion

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The *City APEGA LPs* selected must have competent knowledge about the scope of *PEG* work planned for procurement and be able to assist the Business Area Purchaser/Project Manager with questions related to *authentication*, *validation*, and *outsourcing*.

Each section of the form is assigned specific personnel to assist. While the personnel may change from section to section, they typically remain the same until that section is completed.

8.2. Section A: Outsourcing Requirements - Description of Work Compliance Review

This section ensures that the specific scope of *PEG* work meets *outsourcing* requirements and involves the *City's* professional engineering or geoscience *LPs*. Section A of the forms contains detailed requirements and must be completed in full.

After the Business Area Purchaser/Project Manager drafts the *DOW*, the assigned *City APEGA LP* reviews it for the planned *professional service* procurement to verify it is complete. When the scope of work planned for procurement involves multiple *disciplines*, *LPs* from each *discipline* must be involved in the review of the *DOW*. The assigned *APEGA LP* must use their professional judgment to involve *LPs* from other *disciplines* as needed.

The *DOW* may not be fully developed at the *standing arrangement* stage. It is sufficient to include headers for the required sections with as much detail as possible, along with a note that further details will be provided when developing *call-up* assignments. Regardless, the *DOW* must still be reviewed. At the *call-up* stage and for standalone contracts, the *DOW* must be thorough and meet all the requirements in the section.

Both Business Area Purchasers/Project Managers and *City APEGA LPs* must refer to "DOW Instructions," which includes placeholders for the required information that can be copied and pasted into the *DOW* being created.

For *call-ups,* the Business Area Purchaser/Project Manager must ensure the *standing arrangement* or pre-qualification list Contract Manager (such as the Standing Arrangement Manager) reviews the specific *DOW* to confirm it falls within the allowed scope. Typically, the Business Area Purchaser/Project Manager consults with the Contract or Standing Arrangement Manager to confirm this. However, if the Business Area Purchaser/Project Manager has previously confirmed that the scope of work falls within the allowed parameters for the same services, and has indicated this on the form, further consultation is not required.

When *outsourcing* services in areas of overlapping practice, as described in the "COE-PEG-SOP-0001 Professional Practice Management Plan," an *RM* or *LP* can use their professional judgment to determine if the work falls into overlapping practice and whether or not the work can be performed by others defined in *APEGA's* joint practice

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standards. Regardless, when *outsourcing* such services to such external entities, Section A must be completed as described in 'Section 7.2.'

The form provides guidance to the Business Area Purchaser/Project Manager for completing the *DOW*, ensuring all required sections are included. It also requires the assigned *City APEGA LP* to review the *DOW* and confirm that the *PEG* services are adequate and complete. Upon completion, the Business Area Purchaser/Project Manager must confirm that any concerns raised by the *LP* have been addressed.

8.3. Section B : Outsourcing Requirements - Selection Compliance Review

This section ensures that all necessary clauses and information are included in contractual documents to meet *outsourcing* requirements and establish the procurement framework before selecting *outsourced entities*.

For *standing arrangements* and standalone contracts, completing this section is necessary and is included in both *outsourcing* forms. For *call-ups*, this section is modified, as provisions should have already been included at the *standing arrangement* stage. If new *PEG* providers are introduced at the *call up* stage, then additional steps are required, involving the contract manager or Standing Arrangement Manager. If the *standing arrangement outsourcing* form was not previously completed, contact the *PEG Practice Office* prior to developing *call ups*.

This section requires the Business Area Purchaser/Project Manager to confirm the appropriate clauses will be included when preparing draft contractual documents, including sourcing events. Standard wording for specific scenarios (for both competitive and non competitive procurements) is provided in the forms and must be used. CPSS Buyers can assist as needed. If standard contract templates are not used, Legal Services must be involved. Section B in each form contains detailed requirements and must be completed in full.

In addition to linking to contractual documents, the Business Area Purchaser/Project Manager must also consider the following when completing Section B:

8.3.1. PEG Clauses (Part B2.1)

Specific clauses have been developed by the *PEG Practice Office*, Legal Services, and CPSS for contracts requiring *PEG* services. These *PEG* clauses must be included, even if the *outsourced entity* is not a *Permit Holder* with *APEGA* (e.g., architectural firm, landscape architectural firm, etc.). These clauses include *outsourcing* requirements, such as contractually obligating those providing *PEG* services to meet relevant statutes, bylaws, standards, codes, and *APEGA's* standards. The templates containing the *PEG* contractual clauses can be found in the Ariba template folder.

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8.3.2. Evaluation Criteria - Demonstrated Experience (Part B2.2)

The evaluation criteria must ensure a fair process for evaluating or selecting prospective suppliers and their subconsultants based on their previous experience delivering similar *professional services* described in the *DOW*. While the exact approach may vary depending on the Business Area and nature of the work, the *City* must consider demonstrated experience in their decision to award work for both competitive and non-competitive procurements.

This may include developing evaluating criteria based on:

- the number of projects delivered similar in scope and complexity
- the project environment (e.g., climate)
- knowledge of relevant regulations, statues, bylaws, codes
- the team's qualifications and experience, including key members involved in the project (relevant certifications, licenses, degrees, years of experience, specific roles and responsibilities in previous similar projects, professional development)
- project outcomes (request evidence of project outcomes, such as project timelines, budgets, client satisfaction, recognition)
- lessons learned from previous similar projects
- examples of how the team handled unexpected challenges or changes in project scope

Although the exact evaluation criteria will vary depending on the project, including demonstrated experience as a criterion is required to meet *outsourcing* requirements.

Additionally, the evaluation committee must typically include a *City APEGA LP* familiar with the scope of work. If a committee is not formed, a *City APEGA LP* must still be involved in reviewing demonstrated experience for acceptability before work is awarded. Approval from the Business Area *RM* is required for any exceptions.

The form asks the Business Area Purchaser/Project Manager to confirm evaluation criteria or the selection decision will include this information and that *City APEGA LPs* will be involved.

Note: the General Condition (GC) template for *professional services* requires consultants to notify the *City* and obtain its approval before engaging new subconsultants. Refer to 'Section 7.4' for more information on approving new subconsultants or delegated designers after contracts are awarded.

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8.3.3. Licensure Status (Part B2.3)

Contractually, all engineering and geoscience *professional services* must be delivered by firms and individuals actively licensed with *APEGA.* The form asks the Business Area Purchaser/Project Manager to confirm this information will be requested during the selection process and that it will be verified through the "APEGA Permit Holder and Member Directory."

8.3.4. Professional Practice Management Plan(s) (Part B2.3)

PPMPs must comply with the "APEGA Professional Practice Standard Professional Practice Management Plan." The *City* is required to request *PPMPs* (or portions of them) to ensure adequate and acceptable processes as part of the procurement. Firms may submit only the requested processes if they do not wish to submit their entire *PPMP(s)*. The form asks the Business Area Purchaser/Project Manager to confirm this information will be requested during the selection process.

8.3.5. Professional Reputation (Part B2.3)

"APEGA Professional Practice Standard for Relying on the Work of Others and Outsourcing" requires the *City* to select *PEG* suppliers based on professional reputation. To do this, the *City* must request, consider, and accept the supplier's response to a standardized question, either as a pre-condition of award or prior to executing a contract. The Business Area Purchaser/Project Manager and the assigned *APEGA City LP* will determine whether the responses are adequate and acceptable as part of their future decision to award the work. The Business Area *RM* can be consulted, if required. The form asks the Business Area Purchaser/Project Manager to confirm this information will be requested during the selection process. Standard wording is provided in the form.

8.4. Section C: PPMP Collection and Review

This section documents the collection and review of *PPMPs* from *outsourced entities* the *City* intends to engage with. Whenever possible, *PPMPs* should be collected and reviewed before awarding or executing contracts. For subconsultants or delegated designers introduced after contract award, refer to 'Section 7.4.' Section C of the forms contains detailed requirements and must be completed in full.

The *City's PEG Practice Office* must review *PPMPs* (or portions of them as described in 'Section 8.4.3') to ensure adequate and acceptable processes.

Completion of this section is necessary for *standing arrangements* and standalone contracts, and it is included in both *outsourcing* forms. For *call-ups,* this section is not required if it was completed during the *standing arrangement* stage; therefore, it is not

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included in the *outsourcing* form for *call-ups*. If it was not previously completed, please contact the *PEG Practice Office*.

In some cases, it may not be possible to collect *PPMPs* until the *call-up* assignments are developed and bids are received, as *PEG* providers may not be known earlier. In such instances, *PPMPs* must be collected and reviewed as soon as practical before issuing *call-up* orders or awarding or authorizing work to begin. The Standing Arrangement Manager must update the relevant *standing arrangement outsourcing form* with this information.

While *PPMPs* are typically reviewed during the establishment of a *standing arrangement* or a standalone contract, the *City* may request them at any time during contract execution.

The forms asks the Business Area Purchaser/Project Manager to include a link to the *PPMP(s)* collected and for a link to the *PPMP* review performed by the *City*. The Business Area Purchaser/Project Manager and *PEG Practice Office* must also consider the following when completing Section C:

8.4.1. Outsourced Entities Licensed with APEGA (Part C.2.1)

PPMPs must be collected from each *outsourced entity* the *City* intends to engage for *PEG* services. If the *outsourced entity* is an *APEGA Permit Holder* and plans to subsequently *outsource* or engage subconsultants (or delegated designers), the *City* does **not** require *PPMPs* from these subconsultants. However, *PEG* contract clauses allow the *City* to request them in the future for audit purposes.

8.4.2. Outsourced Entities not Licensed with APEGA (Part C.2.2)

In this case, *PPMPs* must be collected from each subconsultant used by the *outsourced entity* to deliver *PEG* services. If the proposed *PEG* subcontractors are not known at that time of procurement, *PPMPs* must be collected as soon as possible after their identification.

8.4.3. PPMP Review (Part C2.1 and C2.2) Practice Office Responsibility

During the review of *PPMPs*, the *PEG Practice Office* will complete and retain a "COE-PEG-FORM-0005 PEG Professional Practice Management Plan Review Form."

The *PEG Practice Office* will verify that the collected the *PPMPs*:

- are dated within the last 18 months of the review date
- are signed by the *Permit Holder's RM* and *Senior Officer*
- contain adequate and acceptable processes for:

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- *quality assurance* and *quality control* for *professional services*
- *authentication* and *validation* of *PWPs*
- *consequential change* management
- subsequent *outsourcing*

When assessing whether the above processes are adequate and acceptable, the *PEG Practice Office* will use the following criteria:

- the processes exist
- the processes reference the appropriate *APEGA* practice standards
- the processes meets the minimum requirements in *APEGA's* practice standards

If a *PPMP* does not meet expectations, the *PEG Practice Office* must work with the Business Area Purchaser/Project Manager to address the concerns before executing contracts.

8.5. Section D: Contract Execution for Projects Involving Engineering & Geoscience

The purpose of this section is to ensure the *professional service* providers adhere to the processes outlined in their *PPMP(s)*. While the *City* cannot guarantee that providers strictly adhere to every aspect of their *PPMPs*, the *City* is required to check they meet *APEGA's* minimum requirements as part of self regulation obligations. This includes checks to ensure that *authentication* and *validation* are present and compliant with the required standards, as well as ensuring that any *consequential changes* requiring re-*authentication* and re-*validation* are properly executed. Section D of the forms contains detailed requirements and must be completed in full.

This section is included in *outsourcing* forms except for the *standing arrangement outsourcing* form and is completed during the contract execution phase. The Business Area Purchaser/Project Manager, with assistance from a *City LP* if needed, is responsible for ensuring that the *outsourcing* requirements detailed in the form are met. Project Managers may include additional copies of Section D (particularly from D.3 onward) to accommodate different stages of projects, such as for planning and delivery, if *professional services* are submitted at various phases under different Project Managers.

The Business Area Purchaser/Project Manager must also consider the following when completing Section D:

8.5.1. Interface Management Process (if applicable) (Part D.2)

The *City* typically does not engage multiple separately contracted *outsourced entities* for the same project. However, if this approach is taken, the Business Area Purchaser/Project Manager is responsible for creating an Interface Management Process using the "COE-PEG-TMPL-0012 PEG Outsourcing Interface

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Management Process Template," which must meet the requirements outlined below.

In general, the *City* may contract with a single entity who then subsequently *outsources* to multiple *professional services* providers. In such cases, the *City* must require the *outsourced entity* to develop an Interface Management Process that details the following (this does not apply if the *outsourced entity* is an architectural firm, registered with the Alberta Association of Architects, provided they are using the National Building Code (Alberta Edition) and its building schedules, as these contain the interface management required):

- *City* responsibilities
- *outsourced entity* responsibilities
- protocols when the scope of one *outsourced entity's* work may impact the work of another's *outsourced entity's* work; and
- when applicable, a procedure for integrating multiple *PWPs* to ensure *authentication* and *validation* conforms to the "APEGA Professional Practice Standard for Authenticating Professional Work Products"

The requirement for an Interface Management Process is included in contractual language for *professional service* contracts containing *PEG* clauses. It is the responsibility of the Business Area Purchaser/Project Manager to ensure contractual requirements are met and this process/plan is collected.

When *outsourcing* to multiple entities, the *outsourcing entity* must ensure that an adequate and acceptable process is in place and followed and that, when applicable, the final *PWPs* are properly *authenticated* and *validated*.

The Business Area Purchaser/Project Manager must indicate on the form whether an Interface Management Process is required. If so, they must create or request the process and include a link to it.

8.5.2. Quality Control and Assurance - PEG Project Management (Part D.4)

The *City* is required to follow documented project management processes for capital projects outlined in the "City Standard - Project Management for Capital Projects." In addition, all *City* contract managers must use the "City Administrative Policy - Contract Management" when executing contracts. Together, these effectively ensure *City* projects are managed appropriately.

This form requires Business Area Purchaser/Project Managers to confirm a project management system used. At a minimum, the project management process used must address the requirements in the form. If a formal project management system is not used to address these requirements, a comment is required to explain why the particular processes are not followed. This could be

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due to reasons such as size and complexity of the *outsourced* work. This meets *APEGA's outsourcing* requirement for ensuring *professional service* providers are following *Quality Control* and *Quality Assurance* processes.

8.5.3. Authentication and Validation of PWPs (Part D.5)

All *PWPs* delivered as part of a *PEG* project must be checked for proper *authentication* and *validation* (refer to "COE-PEG-WI-0005 Job Aid for APEGA Authentication & Validation Requirements"). The Business Area Purchaser/Project Manager must manage all *PWP* submissions, either by creating a submittal tracking sheet and including a column for *PWP* identification, or by other means. In addition, they must ensure all *PWPs* identified in the *DOW* are submitted by providing a link to a submittal log or folder on the form. The form also asks the Business Area Purchaser/Project Manager to confirm all *PWPs*, identified in the *DOW*, are delivered and checked for *authentication* and *validation.*

8.5.4. Consequential Change Management (Part D.6)

Business Area Purchasers/Project Managers must ensure *consequential changes* are approved by the *authenticating LP* (where possible) to comply with "COE-PEG-SOP-0008 Record Documents and Redlines." In addition, they must ensure the *outsourced entity* is involved and follows their documented change management process (related to *PWPs*). If Business Area Purchasers/Project Managers are unclear about the nature of a change, they must consult with either the *authenticating LP* or the *City APEGA LP* assigned on the form.

Contractual requirements in the Supplementary General Conditions (SGCs) include a requirement that subsequent *consequential changes* affecting *PWPs* are re-*authenticated* and re-*validated* by the consultant (or their subconsultant).

In addition, Business Area Purchasers/Project Managers must ensure field revisions are handed in accordance with "COE-PEG-SOP-0005 Verification, Authentication, and Validation of Engineering & Geoscience Professional Work Products."

Note, it is generally not acceptable to *authenticate* only the *record document/drawing* after a series of *consequential changes*. *Consequential changes*, or a small series of such changes, must be *authenticated* as soon as possible after issuance, to comply with Section 4.8 of "APEGA Professional Practice Standard for Authenticating Professional Work Products."

The Business Area Purchaser/Project Manager confirms the above requirements are met by providing a link to a managed change log (where *consequential*

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changes are identified) or providing a comment on how *consequential changes* are managed throughout the execution of the contract on the form. In cases where there are no *consequential changes*, this must also be indicated on the form.

At the end of the project, they attest that all *consequential changes* are *authenticated* and *validated* and that *record drawings* (if applicable) have also been *authenticated* and *validated*. Project completion for the purposes of this *SOP* typically means when the final *PEG* deliverables are submitted and the engineering/geoscience work is complete.

8.5.5. Document Management (Part D.7)

This field asks the Business Area Purchasers/Project Manager to confirm that all *technical documents* are stored in an appropriate *Document Management System*, as outlined in "COE-PEG-SOP-0004 Engineering and Geoscience Document Management."

8.6. Form Completion

This field asks the Business Area Purchasers/Project Manager to attest that they will file the *outsourcing* form with the project in a folder called *'outsourcing'* and that the *outsourcing* form is complete.

9. Templates & Forms

- COE-PEG-FORM-0002 PEG Outsourcing Form - Standalone Contracts for PEG Services
- COE-PEG-FORM-0003 PEG Outsourcing Form - Standing Arrangement for PEG Services
- COE-PEG-FORM-0004 PEG Outsourcing Form - Call-Ups under Standing Arrangements for PEG Services

10. Attachments

10.1. RACI Chart

Responsibility and Accountability Matrix					
Task:	**Project Manager/Business Area Purchaser**	***Responsible Members***	***City APEGA LPs***	**CPSS Buyers**	***PEG Practice Office***
Identify if *PEG* Service	A, R	-	C (assists if required)	C (assists if required)	C (assists if required)
Selecting *APEGA*	A, R	C (assists if	-	-	C (assists if

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RM		required)			required)
Selecting *City APEGA LP*	R	A	C	-	-
Select appropriate *Outsourcing* Form	A, R	-	-	-	C (assists if required)
Section A of forms (DOW Compliance Review)	A, R	-	R	-	-
Section B of forms (Selection Compliance Review)	A, R	-	-	R	-
Section C of forms (*PPMP* Collection & Review)	A, R	-	-	C (assists if required)	R
Section D of forms (Contract Execution)	A,R	-	C (assists if required)	-	-
Completing the *Outsourcing* Form & Retaining it in Project Documentation	A, R	-	-	-	-

A: Accountable (the individual ultimately answerable for the completion of the task)
R: Responsible (the individual or people who do the work to achieve the task)
C: Consulted (the individual or people whose input is sought before the task is completed - if necessary)

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Standard Operating Procedure

PEG Internal Practice Reviews

Document #: COE-PEG-SOP-0010

Version: 05

Approved By:

Nicole A. Wolfe	2026-08-31	
Name	*Date*	*Signature*

Branch Manager, Building Great Neighbourhoods & APEGA Permit to Practice Senior Officer
Title

VER	Date	Revision Summary	Author	Review	Check
05	2026-08-31	Revised to include the requirements and procedures for PEG project-based internal practice reviews	NAHADA HARRIS	NAHADA HARRIS	DARYLE TILROE
04	2024-08-26	Revision for internal practice review cycle and scheduler. Refer to 'Revision Notes' for details	ROMEL CHAVEZ	CARLA WONG	DARYLE TILROE
03	2024-02-02	Revision following initial procedure implementation, including integrating process improvements and refined language for adherence to style guide. Refer to 'Revision Notes' for details.	NAHADA HARRIS	CARLA WONG	DARYLE TILROE

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Applicability

This *Standard Operating Procedure* (*SOP*) applies to all individuals involved with *Professional Engineering and Geoscience* (*PEG*) work conducted by and for the *City of Edmonton* (*City*). This includes all *City* employees (full-time, part-time, and temporary employees), contract staff whose work constitutes the *practice of engineering or geoscience*, and staff who support *PEG* work.

Synopsis

This *SOP* provides the requirements and procedures that must be followed to comply with the *PEG Quality Management System (QMS)* for *internal practice reviews*.

Revision Notes

The document has been revised to include the requirements and procedures for project-based PEG internal practice reviews in addition to the group-based reviews conducted by the Practice Office. These updates have been reflected throughout the document. Revisions include:

- Section 2 - Scope of the document has been revised to include project-based reviews
- Section 5 - Roles and Responsibilities has been updated to include specific responsibilities pertaining to project-based reviews. Other changes include:
    - Removed 'Deputy Officer (DO)' role
    - Removed the documentation of review summary and findings from panel responsibilities, as this is primarily the function of QMS Administration under the direction of PEG Quality Manager
    - Added providing direction and support to QMS Administration to the PEG Quality Manager responsibilities.
- Section 6.2 - Updated to include projects-based reviews in the annual internal practice review plan
- Section 6.4 and 7 - Updated to include the new PEG Project Review Report Template

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1. Purpose

The purpose of the *internal practice review* program is to confirm adherence to the *Professional Engineering and Geoscience* (*PEG*) *Quality Management System* (*QMS*) and associated procedures. This document describes the planning, preparation, reporting, and management of the *PEG internal practice review* process. In addition, it is expected that learnings from the *internal practice review* process will assist in the *continuous improvement* of the *QMS* and the *PEG* work carried out within the *City*.

2. Scope

This *Standard Operating Procedure* (*SOP*) outlines the requirements and procedures for *internal practice reviews* of the *PEG* activities conducted by or for the *City*. There are two types of *PEG internal practice reviews* conducted by the *Practice Office* to confirm adherence to the *PEG QMS*:

1. **Group-Based:** Reviews conducted at organizational group level and scheduled on a recurring cycle.
2. **Project-Based:** Reviews conducted at the project level, with specific projects selected by the *Practice Office*

3. References

- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System
- COE-PEG-SOP-0011 Non-Conformance Process

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in the "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *Quality Management System* documents, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained.

4.1. Opportunity for Improvement (OFI)

Identification of an opportunity to improve the internal process being reviewed or the *Quality Management System* itself as part of a *continuous improvement* process.

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5. Roles and Responsibilities

5.1. Internal Practice Review Panel

Actively conducts *internal practice reviews* and contributes to evaluating the *PEG QMS.* Responsibilities include:

- being familiar with the *QMS* and associated *SOP*s
- reviewing internal processes against the *QMS* by actively participating in the review meeting, asking questions, examining evidence, and probing for understanding
- identifying *non-conformance*s, *opportunities for improvements* (*OFIs*) and best practices resulting from the review

5.2. PEG Quality Council (PEGQC)

Responsible for overseeing the *internal practice review* process. Specific responsibilities include:

- reviewing the annual *internal practice review* report
- reviewing the annual *internal practice review* plan
- staying informed of *Non-Conformance Reports* (*NCRs*) issued
- reviewing overall trends and systemic issues as identified by the *PEG Quality Manager*
- recommending improvements to the *QMS* and associated *SOPs*
- recommending training or communications to address systemic issues

5.3. PEG Quality Manager

Responsible for the development, implementation, and *continuous improvement* of the *internal practice review* process, including:

- developing and stewarding an annual *internal practice review* plan as defined herein
- creating an annual *internal practice review* report
- providing direction and support to *QMS Administration* in fulfilling their responsibilities
- updating the *PEG Quality Council* (*PEGQC*) on progress and findings of the *internal practice reviews*
- acting as an *internal practice review* panel member

5.4. Professional Practice Leader (PPL)

Responsible for providing professional expertise, direction, and guidance on questions pertaining to the *practice of engineering and geoscience* that may come up through the *internal practice review* process.

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Specific responsibilities include:

- ensuring the annual *internal practice review* plan is carried out
- serving as a potential *internal practice review* panel member.
- assuming responsibility of the *PEG Quality Manager* in their absence

5.5. Quality Management System Administration

Under the direction of the *PEG Quality Manager*, supports execution of the *internal practice review* process.

Responsibilities include:

- scheduling and organizing *internal practice review* meetings
- communicating and coordinating with all participants, including respondents and the *internal practice review* panel
- taking summary discussion notes
- consolidating *internal practice review* panel notes and preparing the consensus review report
- documenting *non-conformances* and their associated *corrective action*(*s*) in the *non-conformance* register.

5.6. Respondents

Participates in the *internal practice review* meeting on behalf of the organizational group, or project being reviewed. This includes the applicable *Responsible Member (RM), Licensed Professionals (LPs)*, Project Managers, or any other staff nominated by the respondent *RM*. Responsibility of the respondents, including *RM* respondents, comprises:

- preparing for the *internal practice review* meeting
- responding to queries posed by the *internal practice review* panel
- gathering and presenting evidence and supporting information to demonstrate compliance
- addressing any follow-up action items which are assigned during the review

Additional specific responsibilities of *RM* respondents include:

- collaborating with the *Practice Office* to ensure the effective execution of the annual *internal practice review* plan
- actively participating in the scheduled *internal practice review* meeting; *RMs* are required to participate in *internal practice review* meetings, particularly for group-based reviews. While it is highly encouraged for *RMs* to attend these sessions, in the event of unforeseen circumstances preventing their attendance, they must promptly delegate their responsibilities to a senior staff member or an alternate *RM*.

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- ensuring required members from their group(for group-based reviews) or staff involved in the project execution (for project-based reviews) are invited and available for the *internal practice review* meeting
- coordinating with the *Practice Office* to finalize the *internal practice review* report within the stipulated time frame

Additional specific responsibilities of Project Manager respondents include:

- collaborating with the *Practice Office* to provide the requested project related information and documentation in advance to ensure a smooth review process
- providing the *internal practice review* panel with the necessary access to project documentation folders

5.7. Responsible Member (RM)

May participate in *internal practice reviews* as either an *internal practice review* panel member or as a respondent *RM* representing their respective group. For information on responsibilities associated with the role assumed by the *RM*, refer to the corresponding role in this Section of the document.

5.8. Review Leader

Act as the *internal practice review* panel lead. Responsibilities of a review leader, in addition to that of an *internal practice review* panel member, include:

- facilitating and chairing the *internal practice review* meeting
- promoting open discussion by ensuring all meeting participants have the opportunity to express their opinions, questions, and perspectives
- providing regulatory expertise with a comprehensive understanding of regulatory and *QMS* requirements; actively addressing any questions pertaining to regulations
- ensuring that all the questions in the *internal practice review* report template have been asked and addressed during the review
- ensuring respondents are in agreement with *non-conformances* resulting from the review
- ensuring follow-up meetings are scheduled when required

6. Requirements/Procedure

The following steps must be followed:

6.1. Appointing Internal Practice Review Panel Members

The *internal practice review* panel comprises the *PEG Quality Manager* and individuals they appoint to participate in the *internal practice review* process. Each *internal practice review* panel includes a minimum of three members. In addition to the *PEG Quality*

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Manager, the panel may consist of the *PPL*, *RMs* from other sections, and/or others who are not participating as respondents.

RMs are encouraged to contribute to these reviews by serving as *internal practice review* panel members, enabling diverse perspectives and facilitating knowledge exchange. Annually, a roster of at least ten *RMs* are selected to participate as *internal practice review* panel members for the following year. *RMs* may also have the option to voluntarily express their interest to join the panel.

When necessary, the *PEG Quality Manager* organizes training sessions for the *RMs* serving on the *internal practice review* panel, ensuring that panel members possess the necessary resources and knowledge to effectively fulfill their roles in the *internal practice review* process. These training sessions are designed to provide the panel with the essential skills and insights required for a thorough and proficient execution of their responsibilities.

Typically, the *PEG Quality Manager* assumes the role of review leader. In their absence, the *PPL* participating in the *internal practice review* may serve as the review leader.

6.2. Developing an Annual Internal Practice Review Plan

The *PEG Quality Manager* develops an annual plan for *internal practice reviews*, specifying the number of reviews scheduled for the year and identifying the *City* organizational groups and projects to be reviewed. For group-based reviews, this annual plan is formulated using the PEG internal practice review scheduler. The annual plan also includes *PEG* projects selected for review by the *Practice Office*. Additional reviews may also be added to the annual internal practice review plan throughout the year, taking into consideration any identified risks, incidents, or concerns within the organization.

6.2.1. Scheduled Group-Based Reviews

The *Practice Office* maintains and oversees the PEG internal practice review scheduler, which comprises a list of the *City* organizational groups engaged in or supporting *PEG practice* across the *City*. Each group included in the list is scheduled for an *internal practice review* at least once every five years. The scheduler documents the year in which the *internal practice review* is conducted for each group and tracks this information for scheduling future reviews. The *PEG Quality Manager* uses the information in the scheduler to prepare the annual *internal practice review* plan.

6.2.2. Selected Project-Based Reviews

Project-based reviews of selected *PEG* projects are conducted to confirm adherence to the *PEG QMS* throughout the life cycle of the project, including initiation, execution, and delivery. Projects for review are selected by the *Practice*

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Office in consultation with the *PEG Quality Council (PEGQC)*. Typically, projects that are complete or nearing completion are selected to be included in the annual *internal practice review* plan. However, a project may be selected during any stage based on any identified risks, incidents, or organizational concerns.

6.2.3. Supplementary Internal Practice Reviews

At the recommendation of the *PEGQC*, *SO*, and/or the *PPL*, the *PEG Quality Manager* also takes into consideration any risks, incidents, or concerns identified across the organization when selecting *City* organizational groups for supplementary *internal practice reviews*. These additional reviews are independent and not integrated into the established five-year review cycle.

The annual *internal practice review* plan is completed at the end of each year for the following year. The *PEGQC* is consulted before the formalization of this annual plan.

6.3. Planning and Scheduling Internal Practice Reviews

The *QMS Administration* formulates the *internal practice review* schedule, aligning it with the annual *internal practice review* plan and the chosen *internal practice review* panel. Each *internal practice review* meeting is scheduled for approximately two hours and can be conducted either in-person, virtually, or through a hybrid approach. Project-based reviews may also be conducted as desktop reviews, where possible. The *QMS Administration* collaborates with participants, both the *internal practice review* panel and the respondents, and issues invitations and organizes meeting rooms as necessary.

6.4. Preparing for an Internal Practice Review

The *QMS Administration* initiates preliminary preparations for the *internal practice review,* ensuring that specific requirements, where possible, are checked prior to the meeting. The *internal practice review* panel is then informed of any deficiencies in the completion of *QMS* training requirements by the reviewed group, unaddressed or inadequately addressed previous *non-conformances*, and any other known non-compliance issues.

The *QMS Administration* also ensures that the *internal practice review* panel and the respondents have access to the *internal practice review* report template. Based on the *PEG internal practice reviews*, the relevant template will be used to help guide the discussion.

- COE-PEG-TMPL-0009 PEG Internal Practice Review Report Template For Group-Based Reviews
- COE-PEG-TMPL-0002 PEG Internal Practice Review Report Template For Project-Based Reviews

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Prior to the meeting, respondents must review the appropriate template and gather the required documents and other applicable evidence of compliance to facilitate a seamless review process.

6.5. Executing an Internal Practice Review

Internal practice reviews are conducted in an informal, educational manner, and should not be construed as punitive or fault finding. The primary goal is to provide an opportunity for learning and *continuous improvement*. The length of the review meeting may vary, but generally are scheduled for two hours. Additional meetings may be scheduled, if required.

The *internal practice review* meeting is chaired by the review leader; however, any *internal practice review* panel member can ask questions throughout the review process. The *internal practice review* report template serves as a guide for discussion and documentation of any deviations from *QMS* requirements. The template can be modified at the discretion of the review leader. Through interviews and examination of records, the *internal practice review* panel collects and reviews evidence and supporting information. Key discussion points and findings are documented using the template.

6.6. Reporting and Follow-up

6.6.1. Internal Practice Review Findings

Findings from an *internal practice review* that require documentation in the report include any identified *non-conformances*, *OFIs*, and best practices.

- **Non-conformances**
  Any deviations from the *QMS* requirements identified during the *internal practice review* are documented as a *non-conformance* in the report. For each identified *non-conformance*, the *PEG Quality Manager* issues a Non-Conformance Report (NCR) as an attachment to the *internal practice review* report. *Non-conformances* identified during *internal practice reviews* are mutually agreed upon during the review by the *internal practice review panel.* These are then accepted and formalized in the final *internal practice review* report by the respondent *RM* and the *PEG Quality Manager.* The "COE-PEG-SOP-0011 Non-Conformance Process" is followed to ensure the identified *non-conformances* are adequately addressed.

- **Opportunities for improvement (OFIs)**
  No action is necessary for an *OFI*; however, it serves as a recommendation to enhance existing internal processes. The respondent *RM* and group representatives have the option to to address the *OFI* internally, as they see fit.

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- **Best practices**
  As an integral part of the *continuous improvement* process, *internal practice reviews* identify best practices. Best practices identified may be shared with various sections across the *City* to enhance collective knowledge and can also potentially influence future updates to the *QMS*.

In addition to the findings, there may be follow-up action items resulting from *internal practice reviews*. These must be addressed by the respondent *RM* before formalizing the *internal practice review* report.

6.6.2. Issuing the Internal Practice Review Report

The *QMS Administration* will consolidate their own notes along with any notes provided by the *internal practice review* panel to prepare a draft review report, using the applicable template. The *PEG Quality Manager* reviews the draft report prior to submitting it to the respondent *RM* for review, comment, and agreement. Once agreement that the report captures what was discussed in the meeting is reached, the report is signed by the respondent *RM* and the *PEG Quality Manager*. The final report, along with any associated *NCRs* attached, is issued to the respondent *RM*, *PPL*, *internal practice review* panel, and other applicable participants.

A quarterly update on the status of annual *internal practice review plan*, including both scheduled and conducted *internal practice reviews*, is provided to the *PEGQC*. The update includes a summary of findings from each completed *internal practice review*.

6.6.3. Management of Non-Conformances

Once the final report and any associated *NCRs* are issued, the *QMS Administration* is responsible for tracking *non-conformities* to resolution. Each *non-conformance* and its associated *corrective action* are documented and monitored in accordance with the *SOP* "COE-PEG-SOP-0011 Non-Conformance Process."

6.7. Annual Reporting of Internal Practice Reviews

The *PEG Quality Manager* prepares an annual report summarizing the *internal practice reviews* that have been completed during the calendar year. The annual *internal practice review* report includes:

- summary statistics
- trends and systemic issues
- recommendations

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The report must be completed at the end of each calendar year and submitted to the *PEGQC*.

7. Templates & Forms

- COE-PEG-TMPL-0009 PEG Internal Practice Review Report Template For Group-Based Reviews
- COE-PEG-TMPL-0002 PEG Internal Practice Review Report Template For Project-Based Reviews
- COE-PEG-TMPL-0011 PEG Non-Conformance Report (NCR) Template

8. Attachments

None

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City of Edmonton
Overall PEG Practice

Standard Operating Procedure

Non-Conformance Process

Document #: COE-PEG-SOP-0011

Version: 01

Authorized By:

Nicole Wolfe	2023-11-27	
Name	*Date*	*Signature*

Acting Branch Manager, Building Great Neighbourhoods, & APEGA Permit Deputy Officer
Title

VER	Date	Revision Summary	Author	Checked	Approved
01	2023-11-27	Original Issue	Nahada Harris	Carla Wong	Daryle Tilroe

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Applicability

This *Standard Operating Procedure* (*SOP*) is applicable to all individuals involved with *Professional Engineering and Geoscience* (*PEG*) work conducted by and for the *City of Edmonton (City)*. This includes individuals who directly contribute to the *practice of engineering and geoscience* as well as those who provide support for the execution of engineering and geoscience work.

Synopsis

The *City's PEG Quality Management System* (*QMS*) requires a structured approach to track *non-conformances*, addressing any deviations from the *QMS*. This *SOP* outlines the process for documenting, monitoring, and managing *non-conformances,* including associated *corrective* and/or *preventive actions*.

At the discretion of the *Senior Officer* (*SO*), this *SOP* may be used to monitor and oversee *non-conformances* by external consultants in contractual agreements with the *City* for engineering and geoscience services.

Revision Notes

This is the original issue.

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1. Purpose

The purpose of this *Standard Operating Procedure* (*SOP*) is to outline the process for documenting, monitoring, and managing *non-conformances,* including associated *corrective* and/or *preventative actions*. The process is designed to address any identified deviations from the *City of Edmonton's* (*City's*) *Professional Practice Management Plan* (*PPMP*) and the *Professional Engineering and Geoscience* (*PEG*) *Quality Management System* (*QMS*) requirements.

2. Scope

This *SOP* applies to deviations or *non-conformances* arising from the requirements specified in "COE-PEG-SOP-0001 Professional Practice Management Plan" and "COE-PEG-SOP-0002 Engineering and Geoscience Quality Management System." *Non-conformances* related to process requirements may be identified through various sources such as regulatory practice reviews, *internal practice reviews*, and other pertinent sources.

This *SOP* does not apply to *Opportunities for Improvements* (*OFIs*). *OFIs* are recommendations aimed at enhancing internal processes and are not considered *non-conformances.*

3. References

- COE-PEG-SOP-0001 Professional Practice Management Plan
- COE-PEG-SOP-0002 Engineering and Geoscience Quality Management System
- COE-PEG-SOP-0010 PEG Internal Practice Reviews

4. Definitions

Reference should be made to the *APEGA* standards and Website Definitions for basic definitions and additional defined terms. The definitions below will generally not include terms already defined in the "COE-PEG-SOP-0001 Professional Practice Management Plan," "COE-PEG-SOP-0002 Engineering & Geoscience Quality Management System," or other *QMS documents*, however, duplications may be included for ease of reference and added clarity. Definition terms are italicized throughout the text. For convenience, a COE-PEG-Defined Terms Dictionary is maintained.

4.1. Corrective Action

Any action taken to eliminate the cause of an identified *non-conformance,* leading to improvement or series of improvements in internal processes and procedures. The objective of a *corrective action* is to prevent recurrence of the *non-conformance*. A *corrective action* may also incorporate a *preventive action* to prevent the occurrence of future similar *non-conformances*.

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4.2. Non-Conform(ance/ity)

Any deviation from a requirement or the non-fulfilment of requirements outlined in the *Quality Management System*.

4.3. Preventive Action

A proactive measure taken to eliminate a potential cause of a *non-conformance* or deviation from requirements of the *Quality Management System*. *Preventive action* prevents occurrence of the *non-conformance*.

5. Roles and Responsibilities

The following sections outline the roles and responsibilities associated with this *SOP*:

5.1. Deputy Officer (DO)

Supports the *Senior Officer* (*SO)* in carrying out their responsibilities, as delegated and required. The *Deputy Officer* (*DO*) supports the *PEG Quality Manager* in addressing instances of *non-conformance* inaction, as needed.

5.2. Licensed Professionals (LPs)

Responsible for promptly and effectively addressing any assigned *non-conformities*, by implementing *corrective action*(*s*) within the agreed-upon estimated completion date. *Licensed Professionals* (*LPs*) assist *Responsible Members* (*RMs*) in fulfilling their responsibilities as necessary.

5.3. Members-in-Training (M.I.T.s)

Under the direct supervision of an *LP*, responsible for promptly and effectively addressing any assigned *non-conformities* by implementing *corrective action(s)* within the agreed estimated completion date.

5.4. PEG Quality Manager

Holds overall responsibility for implementing and ensuring adherence to the *non-conformance* process. Specific responsibilities include:

- performing a comprehensive assessment to confirm the validity and determine the appropriate classification of potential *non-conformances*
- recommending *corrective action*(*s*)
- preparing *Non-Conformance Reports* (*NCRs*)
- approving, when applicable, requests for estimated completion date extensions of *corrective action*(*s*) implementation
- escalating instances of *non-conformance* inaction to the *DO* and/or *Professional Practice Leader* (*PPL*) when appropriate

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- assessing the evidence of the implemented *corrective actions* as needed to determine their effectiveness
- overseeing the non-conformance register

5.5. Professional Practice Leader (PPL)

Responsible for providing professional expertise, direction, and guidance in identifying, evaluating, and recommending *corrective actions* for *non-conformance*. The *PPL* supports the *PEG Quality Manager* in escalations, as needed.

5.6. QMS Administration

Assists the *PEG Quality Manager* in fulfilling their responsibility for implementing and ensuring adherence to the *non-conformance* process. Specific responsibilities include:

- documenting *non-conformances* and their associated *corrective action*(*s*) in the non-conformance register
- following up with the respective Section when a *non-conformance* resolution is past its estimated due date of completion
- evaluating the provided evidence to ensure the *corrective action*(*s*) effectively addresses the *non-conformance* before closing the applicable *non-conformance*, and seeking input from the *PEG Quality Manager* where needed
- approving requests for extensions of the estimated completion date for implementing *corrective action*(*s*) within their authority

5.7. Responsible Members (RMs)

Accountable for resolving any identified *non-conformances* within their Section. Specific responsibilities include:

- performing a thorough analysis to gain a comprehensive understanding of the root causes behind the *non-conformance* within their respective Section
- appointing suitable Section personnel to ensure the resolution of identified *non-conformities* through *corrective action*(*s*)
- proactively implementing *preventive action*(*s*)/measures to prevent the occurrence of *non-conformance*. *RMs* can delegate this responsibility to a qualified staff member within their respective Section
- submitting extension requests for the estimated completion dates of *non-conformance* resolution, as stipulated by this document, when necessary
- ensuring any *corrective action* recorded in the non-conformance register for their respective Section is completed within or before the estimated completion date

5.8. Senior Officer (SO)

Accountable for implementing and ensuring adherence to the *non-conformance* process, which is a requirement of the *City's* engineering and geoscience *QMS*.

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5.9. Subject Matter Experts (SMEs)

Provides professional expertise, as needed, for *non-conformance* investigations, assessments, and evaluations, and offers recommendations for *corrective actions*.

6. Non-Conformance Process and Requirements

The process for handling *non-conformances* involves the following steps:

6.1. Identifying a Non-Conformance

Non-conformances can be identified through various sources, as outlined below:

6.1.1. Regulatory Practice Reviews

Non-conformities identified during regulatory practice reviews, such as those conducted by *APEGA*, are typically classified as major *non-conformances.* The requirements for addressing these *non-conformities* may deviate from the standard process and will be determined in accordance with the directives of the *SO* and/or *DO*.

6.1.2. Internal Practice Reviews

The *NCR* section of the *internal practice review* report describes the deviations from the requirements of the *PPMP* and *QMS* identified during *internal practice reviews*. The *internal practice review* report is prepared in accordance with the *SOP* "COE-PEG-SOP-0010 PEG Internal Practice Reviews."

6.1.3. Other Sources

A *non-conformance* can also be identified beyond the findings of practice reviews and can be raised by anyone aware of a deficiency or deviation from the requirements outlined in "COE-PEG-SOP-0001 Professional Practice Management Plan" or "COE-PEG-SOP-0002 Engineering and Geoscience Quality Management System." These are typically raised by:

- City Auditors
- Project Managers
- Construction Managers
- Inspectors
- *RMs*, *LPs*, and *M.I.T.s*
- Management
- Stakeholders and internal business partners
- *PEG Quality Council* (*PEGQC*)

The *Practice Office* is notified of any deficiency or deviation from the requirements.

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6.2. Evaluating and Classifying a Non-Conformance

6.2.1. Evaluation

When a potential *non-conformance* is identified, a thorough professional evaluation will be performed by the *Practice Office* to confirm its validity and to determine whether a *corrective action* is necessary. Additionally, an assessment of the severity and risk associated with the *non-conformance* and its actual or potential impact will be performed. This comprehensive analysis leads to the classification of the *non-conformance* as either major or minor.

6.2.2. Classification

The purpose of *non-conformance* classification is to ensure effective implementation of *corrective actions*. Major *non-conformances* require *corrective action*(*s*) to be implemented promptly and with a strong sense of urgency.

Major *non-conformances* impact the *QMS's* ability to achieve its intended results, and they are characterized as systemic, severe, and recurring.

Minor *non-conformances* do not affect the capability of the *QMS* to achieve its intended results and are not considered systemic, severe, or recurring.

6.2.3. Major Non-Conformances with Severe Consequences

Significant deviations from regulatory requirements and established standards can result in a class of major *non-conformance* with the potential for severe consequences, such as potential damage to the *City's* reputation, unethical practice, public safety concerns, harm to public infrastructure, economic loss, environmental damage, or various other critical concerns. When these are identified, the *SO, DO,* or other members of the management team may initiate an investigation. Investigations are conducted by the *PPL,* the *PEG Quality Manager,* or appropriate SMEs as determined by the *SO*. At the discretion of the *SO,* an external investigator may be hired.

The requirements for addressing such *non-conformance* may deviate from the standard process and will be determined in accordance with the directives of the *SO* and/or *DO*. See examples of *non-conformance* classification in Attachment II.

6.3. Estimating Completion Dates for Corrective Action(s)

The *PEG Quality Manager* and the relevant section *RM* collaboratively set an agreed-upon estimated completion date for implementing *corrective action*(*s*) and resolving *non-conformances*. The *RM* consults with their team before finalizing this date, and the projected timeline is documented in the *NCR*.

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6.3.1. The initial agreed estimated completion date must not exceed a period of six months or the duration set by another source, such as *APEGA* or the *City* Auditor. Exceptions to this requirement must be approved by the *PPL* and/or the *DO* and recorded in the non-conformance register.

6.3.2. If the exception is approved, and the initial estimated completion date exceeds a duration of six months, the relevant Section *RM* must provide a status update of the progress of the implementation of the *corrective action* to the *QMS Administration* at least every six months. This update must be documented in the non-conformance register.

6.4. Issuing Non-Conformance Reports (NCRs)

The *PEG Quality Manager* issues *NCRs* using the Non-Conformance Report (NCR) Template. The report is promptly issued to the *RM* of the respective group, Section, or department where the *non-conformance* exists. The *NCR* is also forwarded to the *DO* and *PPL*.

The issued *NCR* details the *non-conformance* and outlines the necessary *corrective action*(*s*) for resolution. The report includes the following information, as applicable:

- *non-conformance* source
- description of the *non-conformance*
- classification of the *non-conformance* as major or minor
- details of where and when the *non-conformance* was identified
- associated risks
- required *corrective actions*
- name of personnel responsible/accountable for the resolution
- estimated completion date for the *corrective action*
- additional attachments

The *PEG Quality Manager* and the relevant *RM* collaboratively agree on the recommended *corrective actions* and their estimated completion dates before formalizing the report. The input of the *PPL* is actively sought when necessary. Following this, the *PEG Quality Manager* issues the report and directs the *NCR* to the *QMS Administration* for documenting and managing the progress of resolving the *non-conformance*. The *PEGQC* is informed of the *NCRs* for awareness.

6.5. Documenting Non-Conformances in the Register

The *QMS Administration* uses the information contained in the *NCR* to document the *non-conformance* and the associated *corrective actions* in the non-conformance register. Each entry in the register is assigned a unique identification number. The register includes all pertinent details from the *NCR* described in section 6.4. Notifications are sent to all relevant parties to establish ownership and accountability.

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Specific details about a *non-conformance* must be readily available and easily accessible from this register. The register will have access controls to ensure users are authorized to access, contribute to, or edit the content. This is essential to prevent unauthorized access.

6.6. Implementing Corrective Action(s)

A clear plan is essential for the effective resolution of a *non-conformance.* The accountable party is the relevant Section *RM* where the *non-conformance* exists. The *RM* ensures that *corrective actions* are implemented within the agreed estimated completion dates. The *RM* can delegate and assign the responsibility for the effective execution of the *corrective actions* to *LPs*, *M.I.T.s,* and other personnel within the Section.

The responsible team should conduct an analysis to understand why the *non-conformance* occurred when addressing the issue and implementing *corrective actions*. Where applicable, *preventive action*(*s*) to avoid similar future *non-conformances* must also be incorporated.

6.7. Managing Non-Conformances

The *QMS Administration* monitors and manages the recorded *non-conformances* in the non-conformance register, ensuring resolution by the agreed-upon completion dates. If a *non-conformance* persists beyond the expected timeline, the *QMS Administration* sends reminders to the accountable *RM*. In cases where these reminders are not acknowledged within the timeline given, the matter is escalated to the *PEG Quality Manager* or the *PPL* for further attention. Ultimately, unresolved matters may be escalated to the *DO* or the *SO*.

6.8. Closing Out Non-Conformances

The *RM* records evidence of *non-conformance* resolution directly in the non-conformance register or provides the necessary information to the *QMS Administration* for documentation. The *QMS Administration* evaluates the provided evidence to ensure the *corrective action* effectively addresses the *non-conformance*. If additional insight is required, the *QMS Administration* consults the *PEG Quality Manager* for input. Once a determination is reached confirming the resolution of the *non-conformance*, it is officially marked as closed within the register. Conversely, if the resolution is deemed unsatisfactory, the matter is communicated to the accountable *RM* for further action.

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7. Additional Requirements

7.1. Requesting Extensions for Corrective Action Completion Dates

If the agreed-upon estimated completion date for addressing a *non-conformance* cannot be met, the *RM* can request an extension.

Refer to Attachment-I of this document for the standard process for requesting extensions of the completion dates.

7.1.1. Major Non-Conformances

Due to the inherent nature of such *non-conformances*, the relevant *RM*, *LPs*, *M.I.T.s,* and other personnel within the Section must make diligent efforts to resolve them within the expected initial time frame.

For major *non-conformities,* extension requests must be submitted in writing by the respective Section *RM* to the *PEG Quality Manager*. The *PEG Quality Manager* may grant up to three extensions per major *non-conformance*, without escalation. Decisions on extension requests are based on reasonability, considering the associated risk and impact on the *City's QMS*. The *PPL's* input is sought when necessary. All necessary details must be documented in the non-conformance register.

7.1.2. Minor Non-Conformances

Extensions for the estimated completion date of *corrective action*(*s*) are typically granted for minor *non-conformances*.

For minor *non-conformities,* the *QMS Administration* can grant up to three extensions, each with a maximum duration of three months, without escalation. Further extension requests, or those exceeding a duration of three months, must be formally submitted in writing to the *PEG Quality Manager*. The *PEG Quality Manager* may grant up to two additional extensions per *non-conformance* without escalation based on reasonability. The *PPL's* input is sought when necessary.

7.1.3. Written Requests and Mandatory Escalations

All written extension requests must include a reason for the request. A record of the written extension request and the approval, if applicable, is maintained in the non-conformance register.

When escalation is required, the *PEG Quality Manager* refers the matter to the *PPL* and/or the *DO*, or *SO* with all relevant details documented in the non-conformance register. Refer to Attachment I for information.

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Note that the process for requesting extensions for estimated completion dates of *non-conformities* detected during regulatory practice reviews (e.g., *APEGA*), or major *non-conformances* with the potential for severe consequences may differ from the standard process and are typically escalated.

7.2. Regulatory and Other Practice Reviews

Requirements for *non-conformances* identified in regulatory practice reviews (e.g., *APEGA*) or other types of reviews (e.g., *City* Auditor) are handled on a case-by-case basis and may not follow this process or meet the requirements in this document. Extension to the initial completion date(s) for *corrective action(s)* generated from all classifications of *non-conformances* detected during these reviews are generally not permitted. The *RM*, *LPs*, *M.I.T.s*, and other Section personnel must aim to resolve the *non-conformance* within the initial completion date.

All such extension requests require written submission to the *PEG Quality Manager* and approval from the *SO* and/or the *DO*. Records of extension requests and approvals, if applicable, are documented in the non-conformance register.

8. Templates, Forms, and Work Instructions

- Non-Conformance Register
- Non-Conformance Report (NCR) Template

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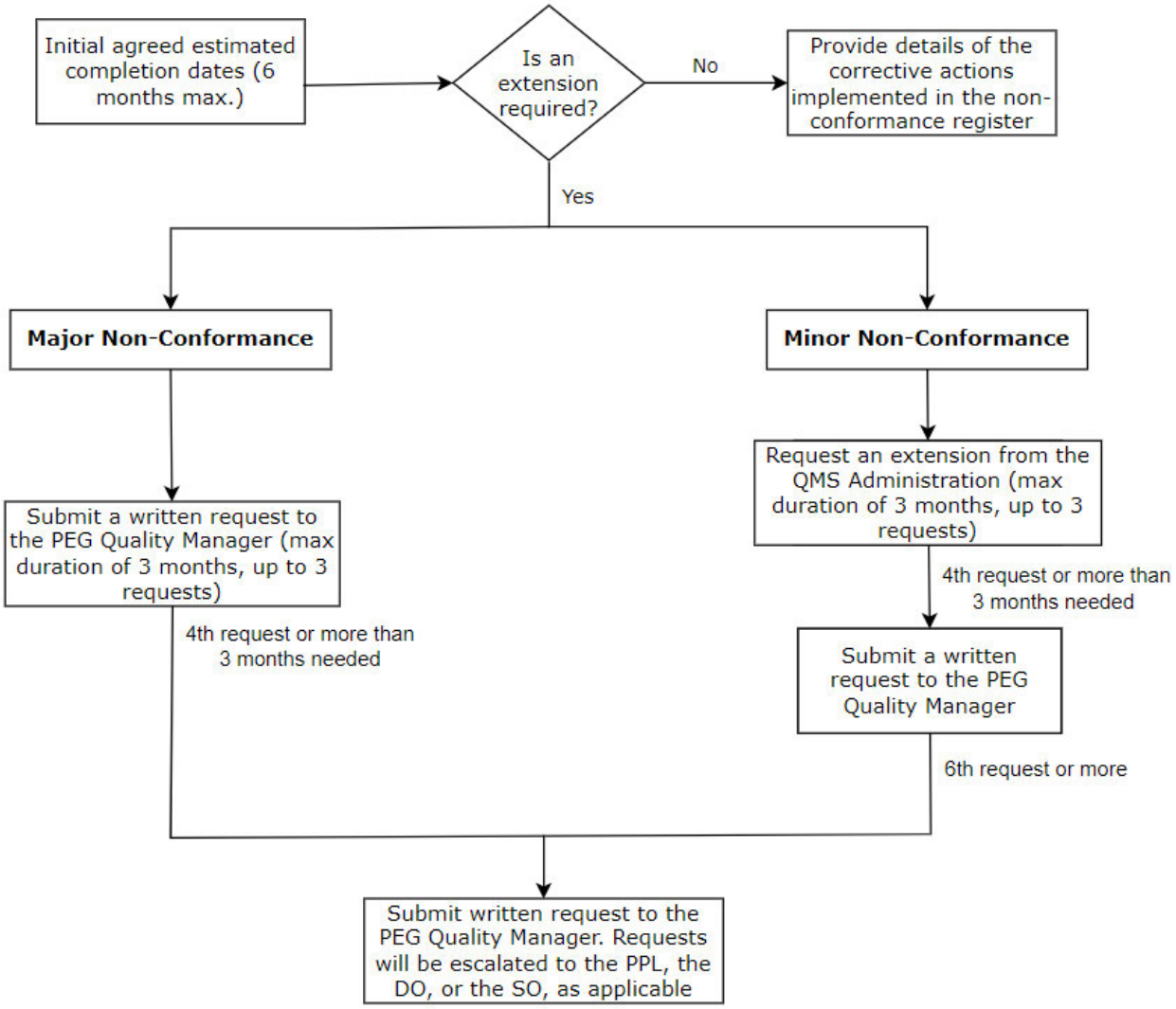
9. Attachments

9.1. Attachment I : Requesting Extension of the Estimated Completion Dates



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9.2. Attachment II : Examples of Non-conformance Classification

No.	Example non-conformance	Deviated requirement	Classification	Justification for the classification
1.	An outsourced final Schematic Design (SD) report which will be relied on by the City for preparation of the Design Development (DD) report is not authenticated and/or validated.	- Authentication, SOP-0005. - Outsourcing requirements, SOP-0009 (ensuring proper authentication)	Major	Non-compliance to two regulatory requirements. Any flaw in the SD report which will be relied on by the City when preparing the final DD report can have negative consequences to the City and in turn the public; as the City will be taking full professional responsibility of the professional work. In addition to corrective action(s), a preventive action must also be incorporated (such as staff training) to prevent repetition of similar non-conformances.
2.	An M.I.T did not complete the required QMS related training.	-QMS, SOP-0002 (competence and training requirement)	Minor	The M.I.T.'s work is directly supervised by an LP and therefore does not affect the capability of the QMS to achieve its intended results. However, training is a requirement and corrective action is necessary.
3.	An outsourcing plan was not prepared when a City project was outsourced to an entity not licensed by APEGA.	- Outsourcing requirements, SOP-0009 (outsourcing to an entity not licensed by APEGA).	Major	An outsourcing plan assigns an accountable LP to ensure compliance to APEGA requirements, such as ensuring correct authentication of a PWP. See example 1 above which can have unwarranted consequences to the City and its quality objectives.
4.	A Digitally Signed Original (DSO) PWP is not appropriately marked, lacking the required metadata tag 'DSOPEGPWP,' as mandated by SOP-004.	-Document Management, SOP-0004 (document identification and original status)	Minor	This does not affect the capability of the QMS to achieve its intended results. However, it is a requirement and corrective action is necessary.
5.	A City Section does not have a	-Document	Major	Technical documents must

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No.	Example non-conformance	Deviated requirement	Classification	Justification for the classification
	repository or a process for document management of its technical documents. Some PWPs are stored on an LP's personal drive.	Management, SOP-0004 (storage, control, access and integrity)		be stored in a DMS with controls to ensure integrity and maintain appropriate access. Storing documents in personal drives may result in inaccessibility if the LP resigns or departs from their position with the City.
6.	For a City Section where obtaining client feedback is required, it is noted they do not document their customer feedback related to the QMS.	- QMS, SOP-0002 (Client relations)	Minor	Although not applicable to every Section, establishing a methodology for obtaining client feedback is required for continuous improvement within the QMS. Though its absence may not directly impact the QMS's capability to achieve its intended results, incorporating customer feedback and subsequent actions enhance the overall effectiveness of the system. In cases where applicable, corrective action is deemed necessary.
7.	An Issued For Construction (IFC) design drawing for a new City-owned recreation center was designed by an outsourced entity without the required professional qualification (i.e., not a licensed professional engineer). The construction project is underway and has reached the 50% completion milestone.	- EGP Act & General Regulation - PPMP, SOP-0001, - QMS, SOP-0002, - Outsourcing requirements, SOP-0009 - Authentication, SOP-0005.	Major- with severe consequences	This can result in severe consequences, posing a major public safety concern. Additionally, it may lead to financial losses, harm the City's reputation, and jeopardize the City's Permit to Practice with APEGA. Several regulatory and City requirements have been breached.

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