Guideline for Professional Practice - Preserved Wood Foundations

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The Association of Professional Engineers, Geologists and Geophysicists of Alberta

FOREWORD

This guideline is an update of the document entitled *Professional Practice for Preserved Wood Foundations – A Guideline,* originally issued in 1991. It was revised to recognize that changes to the *Alberta Building Code* allow preserved wood foundations to be designed and built without the involvement of a professional engineer in certain instances.

An APEGGA guideline presents procedures and practices that are recommended by APEGGA. In general, an APEGGA Member should conform to the recommendations in order to be practising in accordance with what is deemed to be acceptable practice. Variations may be made to accommodate special circumstances if they do not detract from the intent of the guideline.

Guidelines use the word *should* to indicate that among several possibilities, one is recommended as particularly suitable without necessarily mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain course of action is disapproved of but not prohibited *(should* equals *is recommended that)*. The word *shall* is used to indicate requirements that must be followed (s*hall* equals *is required to*). The word *may* is used to indicate a course of action permissible within the limits of the guideline *(may* equals *is permitted)*.

APEGGA's Practice Standards Committee (PSC) publishes practice standards and guidelines to promote high standards of professional practice.

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1 OVERVIEW

Under the *Alberta Building Code* (the Code), the design of a preserved wood foundation (PWF) shall either:

- conform to *CAN/CSA-S406*, *Construction of Preserved Wood Foundations,* or
- be designed by a professional engineer.

Even though a foundation might be built according to *CAN/CSA-S406*, the Code may allow an authority having jurisdiction to require that plans and specifications be stamped by a professional engineer if it is the authority's opinion that the project's size or complexity "may give rise to special safety concerns". Under the *Safety Codes Act*, if a professional engineer is required to design the PWF, the owner is required to retain a professional engineer to carry out a review during construction. Under *CAN/CSA-S406,* if the PWF is installed in "problem" soils (soils with high volume change potential or soils susceptible to frost heave around unheated portions of foundation walls), the backfill and drainage system is required to be designed by a professional engineer.

The original version of this guideline was initiated in response to problems with the design and construction of PWFs. Experience showed that there are a number of critical parts of the design of a PWF that require specific attention to detail or adherence to standards. Some of the particular problem areas are listed and described in Appendix A. An engineer will recognize that this list is not all-inclusive and that there may be other parts of a design which require attention.

1.1 SCOPE

This guideline focuses on the practices and responsibilities of engineers in connection with the design, construction and inspection of a PWF, as specified in the applicable sections of the *Alberta Building Code*. It also provides for certification by the engineer that the design and inspection have been carried out under his or her personal supervision and meet the requirements of the various codes and standards that apply to the specific foundation and site.

1.2 PURPOSE

This guideline has been developed to assist professional engineers and the public to understand the roles and responsibilities of engineers with regard to PWFs. It may also serve as a reference for the Discipline Committee of the Association in adjudicating allegations of unprofessional conduct or unskilled practice.

It is not intended that this guideline supersede or replace the *Alberta Building Code* or the various standards referenced therein.

1.3 DEFINITIONS

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

Authority having jurisdiction

A safety codes officer in the building discipline exercising authority in accordance with the *Safety Codes Act*. Particularly with respect to issuance of building permits.

Professional engineer or engineer
The term is intended to include Registered Professional Technologists (Engineering) whose scope of practice includes the design and inspection of PWFs.

1.4 REFERENCES

This guideline is intended to be read in conjunction with the following documents:

Alberta Building Code (latest version), National Research Council of Canada

Alberta Regulation 16/2004, Safety Code Act, Administrative Items Regulation

CAN/CSA-S406, Construction of Preserved Wood Foundations – A National Standard of Canada: October 2002, Canadian Standards Association.

2 PROFESSIONAL RESPONSIBILITIES

An engineer engaging in the design and/or inspection of a PWF must be knowledgeable in the area of structural analysis and should be a person normally engaged in the design of structures.

An engineer who intends to provide professional services for a PWF is responsible to ensure compliance with the applicable sections of the *Alberta Building Code.*

An engineer who designs and seals a drawing for a PWF, or an engineer who inspects the construction of a PWF, accepts significant responsibilities. These include responsibilities to:

- the building owner, public at large and/or contractor for the safety and serviceability of the foundation;
- the authority having jurisdiction, who will rely on the engineer's certification that the foundation meets the relevant codes and good engineering and construction practice,
- a lender who relies on the engineer's certification as a precondition of advancing mortgage funds.

2.1 SITE LOCATION

The engineer must ensure that the drawings and specifications are site and building specific and show the legal land description of the site, as well as the municipal address, if applicable.

2.2 DRAWINGS AND SPECIFICATIONS

The engineer is responsible for preparing construction drawings, details and specifications sufficient for the contractor or home builder to fully comprehend all stud sizing and spacing, material specifications, drainage and water control requirements, special framing details, and nailing and framing attachments.

2.3 CODE AND STANDARD COMPLIANCE

The engineer is responsible for ensuring that the design complies with the current *Alberta Building Code* and the standards referenced therein.

2.4 NOTIFICATION TO OWNER

Where the *Alberta Building Code* requires that an engineer design a PWF, the design engineer shall advise the owner in writing, with a copy to the authority having jurisdiction, that an engineer must be retained to carry out a review of the construction and the backfill material to be used before any work begins. Unless otherwise specified by the engineer retained for inspection, the inspection has to be carried out before backfilling and in accordance with the schedule of inspection established by the design engineer.

2.5 DESIGN AND INSPECTION CERTIFICATION

Where an engineer is responsible for the design and inspection of a PWF, he or she shall issue the appropriate certificate (see Section 4) when the inspection is completed and all deficiencies have been corrected. Where an engineer is responsible for only the design of a PWF, he or she shall issue the appropriate certificate when the design is completed. Where an engineer is responsible for only the inspection of a PWF, he or she shall issue the appropriate Certificate when the inspection is completed and all deficiencies have been corrected.

3 PROCEDURAL GUIDELINES

The following procedures are recommended with respect to fulfilling the engineer's responsibilities in designing and reviewing the construction of a PWF.

3.1 FAMILIARIZATION

The engineer should familiarize himself or herself as follows:

a) Review current codes and standards.

b) Determine site grades and subsoil conditions.

c) Review architectural plan to identify:

   i. unbalanced backfills

   ii. window openings

   iii. stairwell location(s)

   iv. garage pad elevation

   v. drops or raised areas in subfloors

   vi. brick veneer locations

   vii. basement wall heights

   viii. other relevant components

3.2 DRAWINGS AND SPECIFICATIONS

a) The engineer should ensure that the drawings, specifications, and framing details prepared for a PWF are explicit enough to be understood by the builder.

b) A site and building specific drawing must be prepared for each foundation. It should show the following information:

   i. location of foundation with respect to property boundaries or be referenced to another drawing which provides that information.

   ii. outside dimensions of the foundation wall.

   iii. typical vertical section(s) through the foundation wall showing floor elevations and the elevation at bottom of footing, or equivalent detail.

   iv. portions of the foundation for which each detail design applies.

   v. maximum backfill heights

c) Special framing details required around stairwells, window openings and dropped or raised floors should be detailed on the drawings.

d) Drainage material, nail-fastening connection specifications, damp proofing requirement, lumber specifications and backfill material specifications shall all be shown on the drawings or in the specifications.

e) The engineer responsible for design should review the drawings and specifications with the client prior to start of construction.

f) The site-specific drawing must bear the design engineer's stamp and signature and date it was stamped, and where applicable, the name and permit number of the firm preparing the design.

3.3 INSPECTION

a) An engineer, or a suitably qualified person working under the direction of an engineer, must examine the completed construction of the PWF project to confirm that it has been constructed in accordance with the intent of the drawings and specifications. The inspection may be performed by, or under the supervision of, an engineer who is not the design engineer.

b) If the inspecting engineer is not also the design engineer, he or she should examine the drawings and specific details of the PWF prior to visiting the site. Any uncertainty concerning the design or details must be resolved through discussion with the design engineer.

c) The inspecting engineer must not accept or approve any changes in the design of the PWF without notifying the design engineer.

4 CERTIFICATION

When evidence of an engineer's design or review during construction is required, the following Preserved Wood Foundation Compliance Certificate can be used if acceptable to the authority having jurisdiction, unless the authority requires *Alberta Building Code* schedules to be submitted.

PRESERVED WOOD FOUNDATION COMPLIANCE CERTIFICATE

Prepared by: _____ Date: _____

Project Name: _____

Municipal Address: _____

Legal Description: _____

(Initial the appropriate paragraph and delete the non-applicable paragraphs.)

— I, the professional engineer/registered professional technologist (engineering) engaged to design and inspect the preserved wood foundation, hereby certify that the preserved wood foundation, to the best of my knowledge, complies with the *Alberta Building Code* requirements in force at the time this certificate was signed.

— I, the professional engineer/registered professional technologist (engineering) engaged to only design the preserved wood foundation, hereby certify that the design of the preserved wood foundation, to the best of my knowledge, complies with the *Alberta Building Code* requirements in force at the time this certificate was signed.

— I, professional engineer/registered professional technologist (engineering) engaged to only inspect the preserved wood foundation, hereby certify that the inspection of the preserved wood foundation, to the best of my knowledge, complies with the *Alberta Building Code* requirements in force at the time this certificate was signed.

Signature _____ Stamp

Firm Name and APEGGA Permit Number (if applicable)

_____

APPENDIX A- TYPICAL PROBLEM AREAS

The following list is not intended to include all of the problems that may exist with preserved wood foundations. The engineer is responsible to ensure that the engineering services provided on preserved wood foundations comply with all of the relevant codes, standards and the intent of this guideline.

1 Failure to recognize unbalanced backfill loads.

2 Use of an unqualified inspector to inspect the constructed preserved wood foundation, with the result that improper construction is accepted.

3 Not considering or understanding the significance of the design assumptions in CAN/CSA-S406, *Construction of Preserved Wood Foundations – A National Standard of Canada* and/or CAN/CSA-086.1, *Engineering Design in Wood (Limit States Design).*

4 Failure to prepare and provide a site specific plan.

5 Inadequate communication between client and design engineer, resulting in failure to obtain adequate design input information.

6 Failure to detail special framing, nailing and other requirements for:

a) Main floor construction
b) Window openings
c) End wall blocking
d) Stairwell openings
e) Basement floor to wall connection
f) Dropped Floors
g) Racking loads on walls
h) Stepped footings
i) Drainage system
j) Frost protection

7 Specification of materials that are not readily available in the marketplace.

8 Details and specifications not being understood or followed during construction.

9 Work that is covered up before inspection.

10 Owners seeing engineering involvement as only being needed to get the necessary permits, and once the permits are obtained, the engineered design is not used for construction.

11 The authority having jurisdiction not requiring that the Code requirements relating to engineering of preserved wood foundations be followed.

12 Improper backfill material and backfilling procedures.