

## Draft for Consultation

Your input is requested on the following Framework Element. Engineers Canada is seeking expert feedback and validation regarding independent review of structural design. Key questions for consideration:

- What are the overarching principles regarding an independent review of structural design?
- Where do practitioners have the most difficulty in determining whether to obtain an independent review?

If you have any questions, or would like to submit your feedback, please contact:

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We will be accepting feedback on this element at this time.

**Thank you for your input!**

## Independent review of structural design

in revision:

### Purpose and policy direction

The purpose is to clarify the appropriate use of an independent review of structural design and the nature of the retainer relationships in independent reviews. Published professional standards and practices for the independent review of structural design and the respective obligations under the review retainer will enhance the safety, health and welfare of the public.

### Key considerations

- 1) The regulator will develop standards and guidelines for practicing members regarding requirements for independent review of structural designs.
- 2) Guideline context - The guideline shall
  - a) reflect that it represents a minimum standard and that the engineer should exercise reasonable discretion to go beyond the guidelines;
  - b) confirm that legislative requirements prevail over any conflict with the wording in the guideline;
  - c) identify that it must be read in context with other guidelines and standards and
  - d) indicate that non-compliance is considered a violation of the standards of practice including the code-of-ethics.
- 3) Triggers for a review – The guideline shall

- a) identify the classes of structural designs (external or internal) that require an independent review and, in particular the need to consider potential public risk as a trigger requiring a review;
  - b) identify any classes of structural design that are exempt from a requirement for independent review;
  - c) describe the review requirements regarding repetitive designs;
  - d) the project timing when a review, or reviews in multi-phase projects, must take place and
  - e) those engineers on a project who are primarily responsible and any secondary responsibilities of other engineers on the project to ensure that an independent review is completed.
- 4) Review purpose - The guideline shall discuss the need for the retainer agreement to reflect
- a) the purpose of the review in relation to the design requirements, the relevant code and whether the engineering documents insofar as structural design meet professional standards;
  - b) the appropriate extent of the review and the discretion of the reviewer to extend the scope of review based on progressive findings;
  - c) the duties of the respective parties and
  - d) the method in which any reviewer's critiques, concerns or deficiencies are to be addressed.
- 5) Review activities – The guideline will discuss the review activities such as
- a) the design criteria, loads and performance requirements;
  - b) geotechnical requirements and materials properties;
  - c) integrity and continuity of paths of the gravity and lateral load-resisting systems;
  - d) sufficiency of documentation for identification of the essential components and for construction guidance;
  - e) those items that, in the reviewer's discretion, should be captured by the review and follow-up regarding critiques, concerns or deficiencies identified by the reviewer.
- 6) Review documentation - The guideline will identify
- a) the requirements for documentation of the review activities including
    - i) identity of the reviewer;
    - ii) the timing of the review in relation to the project timelines;
    - iii) the elements of the design that were reviewed;
    - iv) the calculations that were done or confirmed by the review engineer;
    - v) correspondence and notes of oral communications;
    - vi) whether there were any critiques, concerns or deficiencies with the originating engineer or design and the rationale for those and;
  - b) the archiving of copies of all documentation.
- 7) Qualifications of the reviewer - The guideline will identify
- a) minimum qualifications for the reviewer;
  - b) required and appropriate (type and scale) structural design expertise;
  - c) availability of the reviewer to conduct a proper review;

- d) required ability of the reviewer to critique, raise concerns and identify deficiencies;
  - e) required independence and objectivity of the reviewer and
  - f) avoidance of conflicts of interest with the project, the design and the originating engineer.
- 8) Obligations of the originating engineer – The guideline will describe
- a) the ultimate responsibility of the originating engineer over the engineering work notwithstanding an independent review;
  - b) the review requirements in relation to project components designed by other engineers;
  - c) the difference between a reviewer and a verifier, validator or proof engineer;
  - d) the need for overarching structural duties notwithstanding fragmented design functions;
  - e) the obligation not to change reviewers without disclosure to both reviewers;
  - f) required qualities necessary for the engineering documents, structural plans and supporting documents being sent for review including:
    - i) completeness of the design and specifications;
    - ii) accuracy of the details and calculations;
    - iii) site reports including geotechnical, climatic, soil specifications and seismic criteria;
    - iv) design loads and performance criteria and
    - v) such further information as requested by the review engineer;
  - g) transparency and candid disclosure of any assumptions, areas of concern, risks or doubts; and
  - h) the requirement to maintain a willingness to receive all nature of feedback from the reviewer and to maintain an open dialogue with the reviewer.
- 9) Obligations of the reviewing engineer – The guideline will address
- a) the factors that the reviewing engineer shall consider to determine the scope and degree of review including:
    - i) assessing public and property risk;
    - ii) criticality or degree of harm;
    - iii) complexity of the design;
    - iv) industry standards;
    - v) design repetition within the structure;
    - vi) deviations from traditional designs;
    - vii) quality and comprehensiveness of documents from the originating engineer;
  - b) the requirement to maintain a willingness to provide all nature of feedback and to maintain an open dialogue with the originating engineer;
  - c) the requirement to communicate directly with the originating engineer and not with others unless permission is obtained from the originating engineer; and
  - d) the requirements for follow-up activities resulting from critiques, concerns or deficiencies identified by the reviewing engineer.

References:

[Documented Independent Review of Structural Design](#), *Quality Management Guidelines*; APEGBC, March 31, 2016