

Introduction

This Practice Note sets out a recommended methodology to assist structural engineers reviewing another's work. Peer reviewing is a well-accepted part of scientific and academic worlds; and peer review for engineers should be regarded as a positive process and encouraged in the profession. A peer review improves the quality and safety of designs, reduces risk and furthers career development of younger engineers.

The ACSE is not attempting to set out all the various degrees and types of review that may be undertaken but set out guiding principles from which any professional review may be carried out. It is assumed that design engineers will have an in-house review process for use in appropriate projects and a formal QA program. This document refers to review by an external, independent engineer and recognises that there must be a close relationship between the Review Engineer and the Design Engineer to ensure that all objectives and assumptions are included in the review.

This document also aims to ease any fears of a Peer review being carried out on one's work, and allow all engineers to embrace and support (and even initiate!) a review of their designs.

This document is not intended to include a Review of Designs following completion of design and issue of construction documents.

Definitions

<i>Client</i>	The person or body who has requested and commissioned the review.
<i>Design Engineer</i>	The party whose work is being reviewed.
<i>Review Engineer</i>	The reviewing party.
<i>Institution</i>	The Institution of Engineers Australia or "Engineers Australia"
<i>Schedule of Issues</i>	A tabular form of issues raised allowing both engineers to formally and openly communicate
<i>Peer Review</i>	An evaluation of professional work by others working in the same field

When is a Peer Review Appropriate?

Peer review is appropriate when:

- the design is unusual and/or falls outside any Codes of Practice
- when the project or subject matter is high risk (including when the structure is large or important for public safety or in case of financial or economic risk or costs estimates are being made)
- there is a degree of uncertainty in some aspect of the design (it may be the first time that the Design Engineer has undertaken this type of work)
- there is a use of new or exotic materials
- for compliance with a design / project brief e.g D&C contract

This practice note is not intended to relate to:

Dispute Resolution, Expert Witness or Cost Reviews, and while the principles of this Practice Note may be relevant for reviews in these instances, it may not be possible as a Peer Reviewer to always meet the expectations of this Practice Note.

When Should a Peer Review be carried out?

To facilitate improvements in the structural design, a peer review should be conducted as early as possible, preferably at completion of 40% of structural design documentation and certainly no later than 90% completion of the design documentation.

Disclaimer:

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Structural Peer Reviews

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Principles of Integrity ¹

The following principles of integrity apply to all parties:

- a. **honesty** in all aspects of communication;
- b. **accountability** in the conduct of review;
- c. **professional courtesy & fairness** in working with others; and
- d. **good stewardship** on behalf of others.

Scope for Peer review

The *Review Engineer* should enter into a written contract for services which may include the following:

- a. The minimum qualification requirements of the *Review Engineer*. It is expected that the *Review Engineer* shall be at least equal in experience and technical capability to the designer of the work being reviewed (list any other minimum requirements such as membership of professional organisations, previous relevant experience etc)
- b. The purpose and objectives of the peer review.
- c. The scope of the review. The scope can include requirement for comment to be provided on some or all of the following:
 - i. Have the design objectives been met?
 - ii. The validity of the design assumptions
 - iii. The validity of the design conclusions
 - iv. Alternative design options
 - v. Regulations, Australian Standards and codes of practice have been adhered to.
 - vi. The fitness for purpose of the design or suitability of design (being careful to identify precisely what that purpose is).
 - vi. Confirmation of: (a) whom the report is prepared for and (b) who is entitled to rely on the peer review.

Responsibilities - *Review Engineer*

The following responsibilities apply to the *Review Engineer*:

- a. Contact the Design Engineer prior to conducting the Peer Review
- b. Only undertake a peer review if you have the appropriate experience, expertise and knowledge
- c. Ensure the scope of work and fee to be charged is clear (see Scope above). Expressly state any exclusions and identify the deliverables.
- d. Follow the guiding principles of the Institution Code of Ethics ²
- e. Follow Safety in Design Code of Practice including commenting on constructability
- f. Ensure the content and/or outcomes of any process are treated as confidential
- g. Remain objective, impartial, free from bias; do not consider matters that are not relevant to the review criteria
- h. Identify and prioritise structurally critical issues. Refrain from minor comments that do not improve the design, rather are differences of opinion.
- i. Do not take responsibility for the design
- j. Respect and keep confidential any confidential information and Intellectual Property
- k. Notify your client if any conflict of interest arises during the peer review process
- l. Provide comments in a prompt manner and submit on time.
- m. Agree program for Peer Review with client and design engineer.
- n. Identify if the Review Engineer has considered the design assumptions made by the Design Engineer.

¹ [UNSW Procedure for Responsible Peer Review June 2017:](https://www.gs.unsw.edu.au/policy/documents/peerreviewprocedure.pdf)
<https://www.gs.unsw.edu.au/policy/documents/peerreviewprocedure.pdf>

² <https://www.engineersaustralia.org.au/sites/default/files/resource-files/2018-02/Code%20of%20Ethics%2027020218.pdf>

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Responsibilities – *Design Engineer*

The following responsibilities apply to the *Design Engineer*.

- a. To engage co-operatively with the *Review Engineer*.
- b. To provide all relevant documentation including regulations and codes of practice/standards adopted and documents or information requested by the *Review Engineer*.
- c. To clearly communicate any unique or unusual design principles, design assumptions and suppositions.
- d. If the design to be checked is in a foreign language, provide sufficient translations to enable the review to be carried out adequately.
- e. The design responsibility remains with the *Design Engineer*

Responsibilities – *The Client*

- a. Provide a clear scope of work, documents to be reviewed and a suitable contract between client and review engineer.
- b. Give permission and communication details for *Review* and *Design Engineer* to effectively correspond.
- c. Review reports and facilitate resolution where the review and design engineer disagree on critical issues
- d. Provide a program that is agreed between all parties

Suggested process

The following step process is recommended:

- a. After receiving approval from the *Client*, alert the *Design Engineer* of the pending review.
- b. Confirm assumptions made by the *Design Engineer* and if there are any extenuating circumstances relating to the design being reviewed.
- c. *Review Engineer* prepare a written report. The report should clearly define the purpose and scope, identifying any assumptions or exclusions, identifying and listing all information relied on, inspections undertaken, any disclaimers or qualifying statements on work not undertaken and any matters requiring further investigation and include the *Schedule of Issues*.
- d. If structural efficiencies are identified in the review, they should be raised in the schedule to allow the *Design Engineer* to review the design and make modifications.
- e. The client and design engineer consider and elect to action items raised in the peer review report.

Outcome of review process

A natural outcome of the review process may be a difference in opinion. This is not a negative outcome and, in some instances, will be inevitable. Differing opinions drive quality, improvement in design outcomes and help mitigate overall risk in projects. When a difference of opinion arises, the *Review Engineer* and *Design Engineer* are both expected to communicate and interact with his or her peers in a professional, respectful, courteous and informed manner.

The *Review Engineer* is to identify unresolved issues for the client and the design engineers' consideration.

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