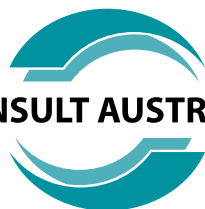


Partnership for Change

Multiple design reviews



AUSTRALIAN
CONSTRUCTORS
ASSOCIATION



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Partnership for Change

The Australian Constructors Association and Consult Australia have joined forces to bring forward sector-wide reform proposals through our Partnership for Change initiative. The initiative demonstrates a solutions-based approach to improve productivity and address challenges in the built environment.

The publication of a series of joint thought leadership papers will provide the basis for collaborative discussions between government, contractors and consultants to drive positive change.

Partnership for Change papers:

🔗 **Multiple design reviews (this paper)**

- 🔗 Reliance information
- 🔗 Model client
- 🔗 Digital technology

Case for change

The Construction Industry has become 25 per cent less productive compared to other Australian sectors over the past 30 years and is facing a critical shortage of workers to deliver the record pipeline of infrastructure projects planned. Against this backdrop, the contractual design process has become increasingly inefficient with excessive reviews that are not enhancing project outcomes or providing value to the clients. In fact, the multiple design reviews infrequently lead to significant physical changes to design and constructed products.

This paper has been prepared to inform clients of the impacts of multiple design reviews. It also proposes process improvements to increase productivity, better utilise limited industry resources and appropriately allocate design risk. Shortening the design process through more efficient review systems will save time and money.

Multiple design reviews

Despite technological advances costs continue to escalate. The requirement for multiple design reviews is an unnecessary cost burden. Design reviews fall in two broad categories:

- **Technical verification, for example:**
 - internal designer verification
 - proof engineering by a third party
 - project scope and technical requirements compliance check.
- **Stakeholder review, for example:**
 - constructability and operator review
 - client review including internal technical departments
 - key stakeholder review—those able to mandate inclusion of comments but not party to the contract (e.g. local councils, rail authorities, operators and utility companies)
 - influential stakeholders such as formal organisations and special interest bodies
 - interested parties either impacted or indirect.

The overall intent of the review processes is confused by the number of reviewers and their scope of review.

Typically, stakeholder reviews have limited governance resulting in no clear escalation

protocol for resolving differences, which ultimately add time and cost to the project. Acknowledging the need for a review process, the following questions must be addressed in developing the process:

- What is the most efficient process which will add value? The contractor/designer is still responsible for the design therefore what is the value add of the third party reviews?
- How do the other certification processes also contribute to the overall risk management of projects regarding technical competence? There are significant requirements and legislation around certification for engineers independent of the project team e.g. Authorised Engineering Organisations in Transport for NSW projects.

There is still a case for third party reviews in areas such as fire life safety and proof engineering in structures. However, the requirement for proof engineering can extend well beyond the risk profile associated with the element of work being designed or the impact of potential failure.

There are significant requirements around certification for engineers independent of the project and delivery requirements which are not considered through this multiple review process. Many of the states like Queensland, Victoria and New South Wales, require engineers to be chartered and registered to operate in specific fields.

Risks

In a design and construct context, the contractor has latitude within specified boundaries to design the works in the way it thinks fit so long as the design and the construction both achieve the contractually mandated and legally required standards and requirements. With this comes a risk profile for the contractor with opportunity for the contractor to rationalise the design and incorporate value engineering.

Stakeholders can dictate design outcomes in a design and construct contract through preferential engineering and scope creep shifting the constructor risk and reward profile towards program losses and costs. Preferential engineering can be a significant issue where reviewers push personal views or preferences rather than identifying non-compliance with project specifications. They are almost impossible to close out in a timely manner.

Governance and timing

Often the timelines for review are significant and/or not set; subsequently, comments begin to impact delivery dates. Further compounding the situation is the increasing lack of central co-ordination of all comments and a single response back to the contractors. This means the contractors are left to resolve conflicting stakeholder requirements without being empowered to resolve the issues.

The process is inherently inefficient due to the numerous review requirements and cycles of closure of comments. On major design and construct projects, a design

package will now typically take 12 months to achieve Issue For Construction, with 30 per cent of this time spent solely in the review process. This impacts schedule and price for contractors and designers and ultimately project owners.

The review process is at multiple stages of the design process with many comments coming in the last stage when comments should be reducing. Following the comprehensive stakeholder reviews in the design phase, the contractor can be faced with a different stakeholder representative at the construction and handover phases, with a new range of comments as preferential changes. Often the timelines for reviews are significant and/or not set with the stakeholder, resulting in comments significantly impacting timelines.

Improving productivity

Streamlining the governance process across the project would enable clients to remove other aspects that do not add value to the process. Typically, these include:

- Technical advisors 1.1% excluding detailed design
- Legal advisors. 0.235%
- Procurement advisors . . 0.076%
- Independent verifiers . . . 1%
- Total 2.5% excluding detailed design

By streamlining the process, skilled resources in short supply can focus on other work, improving productivity across projects.

Recommendations

Our recommendations are:

- Review the process that is set by clients and confirm key outcomes required by the process. Clients need to be more proactive in clearly defining the types of comments required by the reviewer (i.e. project scope and technical requirements compliance) and this should be set out in the contract with the reviewer.
- Set parameters with stakeholders prior to contracting with the delivery partners. Project delivery partners need clients to brief their stakeholders and reviewers appropriately with their scope of review. Stakeholders quite often review the whole scope because they are not sure of their boundaries which adds to superfluous comments which overlap other reviewers.
- Have a clear escalation process for challenging review comments to quickly resolve issues, including empowering delivery partners to resolve conflicting requirements from stakeholders.
- Review how other industries, including the oil and gas industry, undertake stakeholder reviews and incorporate learnings to the construction industry.
- Introduce a triage system of comment categorisation that must be followed by the independent verifier/certifier. The triage system needs to be written into the independent reviewer's contract with the owner playing the role of vetting the comments and adjudicating disagreements on classifications and act as the point of escalation where issue arise and need resolution. For example:

(a) Categories of comments:

Category 1	Category 2
Non-compliance / information required for PV to fulfill their role	Preferential engineering
Category 3	Category 4
Change in scope	New issue from previous submission
Category 5	Category 6
New issue from revised detail	Something we said we would do from previous submission but haven't executed
Category 7	Category 8
Repeat comment on same matter raised in another comment by PV / principal	Question on construction related matters
Category 9	Category 10
Obstructive / pedantic	Disposition requested to deviate from spec

- (b) To control the process and drive efficiency the contractor is only obliged to consider, respond and close out those comments in Category 1, 3, 6, and 10.
- (c) For more progressed design submissions i.e. from detailed design phase to 'issued for construction' Category 4, 5 should be limited.
- (d) Proof Engineering Requirements limited to suitable scenarios and not for low-risk design elements.

Case studies

The following case studies demonstrate how the comment review period adds significant time to the program because every comment takes several people both on the design side and the reviewer's side

to close. Considering the current capability and capacity constraints in the industry, a streamlined process is necessary to reduce the inefficient use of resources in the design review process.

Case study 1: rail facility

Project size	Approx. \$400m Cap Ex
Client	Australian Capital Territory Government as head with major tier 1 contracting joint venture as deliverer
Number of key stakeholders	15+ stakeholders - Development Authority, rail special purpose vehicle, rail operations, rolling stock supplier, transport authority, multiple utility companies, local council
Whether there were proof engineers, verifiers etc.	Independent certifier engaged to certify the design and provide comments during the review process alongside the stakeholders
Number of review processes originally expected	81 review cycles across 25 design packages (excluding specifications)
Number of times on average packages went through the review cycle	237 total >9 per package on average, excluding specifications (81 expected + 18 resubmissions + 138 design changes post Issue for Construction)
Any metrics on the number of comments we would see as "preferential"	78% (3341) comments were ultimately considered to be preferential engineering and resulted in no change to the construction documentation 11% (471) were ultimately deemed materially necessary in terms of the quality of the infrastructure
Stakeholder comments into and verifier	2068
Verifier comments	2215
Impact to client	<ul style="list-style-type: none"> • prolongation as a result of delayed design documentation, • increased design fees due to anticipating the effort needed to resolve the unnecessary comments, and • increased independent verifier / stakeholder costs relating to the 89% of comments that resulted in no meaningful change to the product

Case study 2: precast segmental bridge

Project size	Approx. \$200M Cap Ex
Client	Roads Maritime Services (NSW)
Number of key stakeholders	10+ - rail authority, service authority, utility service providers, power generation and transmission providers, transport authority, local municipal council
Whether there were proof engineers, verifiers etc.	Independent certifier engaged to certify the design and provide comments during the review process alongside the stakeholders
Number of review processes originally expected	37 final detailed design review cycles across 6 major design packages (excluding specifications)
Number of times on average packages went through the review cycle	Total of 91 full package revisions and re-submissions, 57 of which were at feature driven development (FDD) stage. Up to 8 revisions of FDD on several critical design packages
Main impact	Overrun of planned design durations where the average difference across the breakdown of critical packages is an overrun of 40 weeks and the range of over-run is between 10 and 74 weeks
Stakeholder comments into and verifier	The total number of comments received against all packages from design cost data to 'issued for construction' is 5,359

