

# VicRoads Proof Engineering Policy

VicRoads regularly employs consultants to undertake the design of structural assets on its behalf. This policy guides VicRoads' officers on how to manage and mitigate the risk of structural and geotechnical failure.

## Scope

This policy describes VicRoads' approach to managing and mitigating structural design risk. Proof engineering is VicRoads' process for managing risk when it employs consultants to design structures on its behalf, and in instances where developers are required to, or propose to, design assets within or adjacent to the road reserve

Proof engineering is a process of independent review and certification of a design to ensure that the design can be constructed safely, and that it will meet the specified performance requirements, including durability requirements.

VicRoads requires proof engineering of all structures where there is considered to be significant consequences if the structure fails.

Failure, in this instance, is not limited to safety and the structures' ability to support its design load. Failure also constitutes the structures' ability to satisfy long-term durability, design life, and ongoing maintenance expectations.

The pre-qualification categories of PE and GT-PRE, for both structural and geotechnical design, respectively, apply to this policy.

This policy is to be used proactively by VicRoads' officers.

## Detailed Requirements and Performance Standards

### Requirement for Proof Engineering

When considering proof engineering, a risk assessment shall be undertaken and shall consider:

- events that could result in failure, either physical or functional, of all or part of the structure during its construction or operation;
- the potential consequences of such failure; and
- the Principal's project requirements.

## Policy Application

All structures require design and proof engineering by pre-qualified consultants, including the following:

- All new structures that are required to be designed in accordance with AS5100, for both structural and geotechnical design, including developer funded, and other third party, structural works such as cattle underpasses and noise attenuation fences.
- All new structural assets that are not required to be designed in accordance with AS5100. These shall be designed and proof engineered to the relevant Australian Standard, as agreed by the Superintendent, on a case-by-case basis. This includes such structural elements as pre-cast drainage products where it is proposed to use a product that differs from the design shown on VicRoads Standard Drawings.
- Significant modifications to existing structures, including widening and strengthening works, for both structural and geotechnical design.
- Use of proprietary systems or standard components in non-standard applications.
- Major erection equipment and procedures such as tower cranes and launching trusses.
- Critical temporary works such as falsework. In addition, falsework is to be inspected and re-certified following erection in accordance with Standard Section 613 Falsework, prior to any load being applied to it.

Items related to geotechnical proof engineering of geotechnical designs include:

- all cuts;
- all embankments;
- structure foundations;
- reinforced soil structures;
- soil nails;
- ground improvement; and
- slope stability treatments



If in doubt regarding the requirements for proof engineering, advice shall be sought from either Asset Services – Structures or Asset Services – Geotechnical Services, as appropriate.

**Proof Engineer’s Certification**

Specifications shall prescribe the form of the Proof Engineer's Certificate of Compliance (see Reference below).

Disclaimers and additional clauses are not permitted to be included by the proof engineer to qualify any part the proof engineering.

All drawings certified by the proof engineer are to be stamped, signed and dated by the nominated proof engineer, prior to being Issued for Construction. The proof engineer’s stamp must not obscure any part of the design.

Any amendment to the design after the issue of the Proof Engineering Certificate of Compliance shall be referred to the proof engineer for review and written confirmation that the Certificate remains valid.

In addition to written confirmation that the Proof Engineering Certificate of Compliance remains valid following amendments, the relevant drawings shall be re-stamped prior to being issued for construction

**Interim Proof Engineering Certification**

It is acknowledged that, in some instances, project time-frames preclude the completion of the entire part of a structural design to enable proof engineering to be undertaken on the whole of the design.

In such instances, it may be permitted to undertake proof engineering at an interim stage, however it must be demonstrated by the Contractor, by way of the Contractor’s Programme, that the whole of the structural design can not be proof engineered without impacting the Critical Path, and in turn, the Date for Practical Completion.

Where the Superintendent is satisfied that proof engineering of a structural design, in its entirety, is not feasible, interim certification may be issued. In this instance, all assumptions made by the structural designer must be documented on the Issued for Construction drawings and considered by the proof engineer as part of the proof engineering process

**Selection and Engagement of the Proof Engineer**

The proof engineer shall be an independent consultant, who is not for any purpose a partner, joint venturer, servant, agent, or employee of the design consultant or Contractor.

The proof engineer shall be pre-qualified and registered with VicRoads to carry out proof engineering assignments to a category appropriate for the project concerned, PE or GT-PRE, as required

It shall be noted that those individuals nominated as prequalified proof engineers are unlikely to hold pre-qualification in both categories. In some instances, the PE and the GT-PRE may be from different companies as not all consultants have personnel pre-qualified in both categories.

Notwithstanding whether the PE and GT-PRE are from the same company, they will need to liaise such that the PE is satisfied that the geotechnical components of the design have been proof engineered, and that the GT-PRE is satisfied with that part of the design prior to certifying the structural design.

**Responsibilities**

**Table 1 - Roles & Responsibilities of VicRoads Officers**

<p><b>Executive Director Regional Services / Executive Director Major Projects</b></p> <p>Ensure that the Specifications and Quality Systems reflect the requirements of this policy</p>
<p><b>Director Procurement Services</b></p> <p>Maintain a register of consultants pre-qualified to carry out proof engineering</p>
<p><b>Regional Directors / Project Directors</b></p> <p>Ensure that proof engineering is carried out for projects under their control in accordance with this policy</p>
<p><b>Asset Services – Proof Engineering Pre-qualification Panel</b></p> <p>Assessment of technical capability of consultants, and recommend proof engineers to the prequalification scheme based on their assessed capability</p>
<p><b>Strategy and Policy Governance Committee</b></p> <p>Approve this policy</p>

**Policy Evaluation and Review**

This policy will be evaluated and reviewed on a regular basis to monitor its progress towards achieving the intended outcomes.

**Contact Details**

Questions relating to this policy should be directed to the Manager Structural Design, Asset Services, VicRoads or the Manager Geotechnical Services, Asset Services, VicRoads

## Related Documents

Document Title	Reference
Design and Construct Shell DC1	Clause 1170
Proof Engineer's Certificate	Project Management Toolkit

## Policy Governance

Table 2 – Policy Ownership and Approval Record

Policy Ownership and Approval Record			
Business Area Owner – Asset Services			
Rev. No. Date Released	Sections/Update	Description of Revision	Approved by:
Rev. 0 October 2000	First Edition	Development of policy	Gary Liddle on 18 October 2000 (refer Smartdocs)
Rev. 1.0 April 2018	Policy now specifically considers geotechnical risk, structural risk related to developer funded works, and proof engineering of elements designed to Australian Standards other than AS5100.	First review of policy	Strategy and Policy Governance Committee on 18 May 2018
This policy is effective as of the date of approval.			