

PERFORMANCE BASED FIRE ENGINEERING DESIGN

When the Building Code of Australia (BCA) was adopted to replace the various State Building Regulations, it marked the acceptance of Performance Based design to the established prescriptive Deemed to Satisfy (DtS) regulatory structure. Whilst the design of a building may continue to follow the DtS provisions of the BCA, Fire and Security Consulting Services (FSCS) can develop a performance-based, fire engineered design which may be utilised from design inception throughout, or selectively in, the building.

These methods, commonly called "Alternative Solutions" can be used by Fire Engineers to demonstrate that the Performance Requirements of the BCA are achieved by meeting the specified performance criteria in the BCA. By satisfying these criteria, an acceptable level of life safety is deemed to be achieved by the design.

It has become common practice to engage Fire Engineers only when the Building Certifier identifies non-compliances in the design, and the design team concludes that meeting the DtS requirements is inappropriate, overly onerous or restrictive to the design intent. However to achieve real benefits from a Performance Based Design, it is recommended that a Fire Engineer be engaged early in the design process so that design options and economies can be identified and maximised.

Methodology & Scope of Services

- **Phase 1 - Fire Engineering Brief (FEB)**

The basis of this phase is the documentation of the detailed list of non-compliances as identified by the design team as confirmed by the Certifier. The FEB is then developed by the Fire Engineer which outlines these non-compliances and the methodology by which the alternative design will meet the performance requirements of the BCA. This may include alternative, additional or enhanced fire safety or construction measures. A meeting with the Certifier and usually the QFRS Building Approvals Officer then takes place where negotiations take place with the objective of reaching an approval in principle. At the end of this Phase, the outcome of the Building Approval process is able to be confidently predicted.

Clients should note that until the Fire Engineering Brief (FEB) is completed there can be no guarantee that an Alternative Solution will be acceptable to the Building Certifier and the Queensland Fire and Rescue Service (QFRS).

Clients should also note that in addressing any non-conformance, BCA Clause A0.10 requires, when an "Alternative Solution" is proposed, that the Fire Engineer is obliged to -

"Identify Performance Requirements from other sections and parts that are relevant to any aspects of the Alternative Solution proposed or that are affected by the application of the Deemed-to Satisfy Provisions that are the subject of the Alternative Solution."

Consequently, for many projects, Fire and Security Consulting Services recommends that before embarking on the formal assessment and reporting phases that a Preliminary Assessment is conducted.

- **Phase 2 - Fire Engineering Report (FER)**

Subsequent to the FEB, a fire engineering analysis of the proposed design and assessment against the BCA Performance Requirements is undertaken.

The FER usually requires computer fire modelling of one or more enclosures within the building to determine the performance of the building in respect to occupant evacuation, Fire Brigade access and structural stability.

The outcome is the FER which is required to accompany and support the BA approval submission, part of which is a requirement that the Certifier and QFRS provide formal acceptance of the design, allowing occupancy to commence.

Fire and Security Consulting Services also offer additional services to those described, including:

- Providing technical advice during detailed design and construction;
- Review of architectural and other discipline detailed design documentation for compliance with the fire engineering design intent;
- On site inspections for the provision of advice, or for the purposes of confirming compliance with the fire engineering design intent;
- Preparation of any inspection/certification reports as required by the regulatory authorities;
- Preparation of a Management In Use (Fire Safety Plan) if required by the FER and QFRS.