

Fire Safety Engineer interview questions

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What to expect

Fire Safety Engineer interviews test how you reason about code compliance, performance-based design and occupant safety. Employers want to see that you can defend technical judgements to approval authorities, communicate with architects and builders, and stay calm when a design problem lands on your desk.

- **Technical and code knowledge:** Questions about the National Construction Code, Australian Standards, fire engineering briefs and reports, and how performance-based solutions are developed and justified.
- **Scenario and judgement:** Situations where a design does not meet deemed-to-satisfy provisions, a builder deviates from approved drawings, or an approval authority pushes back, testing how you assess risk and respond.
- **Behavioural:** Past examples of working with multidisciplinary teams, managing competing priorities, or handling a project under pressure.
- **Process and workflow:** How you structure a fire engineering assessment from concept through to documentation and construction phase support, including modelling and report preparation.
- **Client and stakeholder:** How you explain technical fire safety issues to non-engineers, manage client expectations and coordinate with certifiers and regulators.

Interviews usually start with a short introductory conversation, then move into technical questions about code interpretation and your modelling experience, followed by behavioural and scenario questions. For many roles you will be asked to walk through a past project or a sample design problem. Some employers include a written or modelling exercise before a final panel interview with senior engineers or a director. Expect to be asked about your registration or accreditation pathway and your familiarity with specific software.

1. Walk me through how you approach a fire engineering assessment for a new building, from first brief to final report.

Why they ask

This is the core process question for the role. The interviewer wants to see a structured method, not a list of software tools, and to check you understand where code compliance, modelling and stakeholder sign-off fit.

How to structure your answer

Give a chronological walk-through. Start with the project brief and design review, cover code analysis and identification of non-compliances, then performance-based solution development, modelling, report drafting, approval authority engagement and construction phase support. Signpost each stage briefly rather than going deep on one.

Example answer

"I start by reviewing the architectural drawings and confirming the building classification, effective height and any deemed-to-satisfy clauses that are likely to be a problem. From there I prepare a fire engineering brief that sets out the scope, the non-compliances and the trial design, and I circulate it to the design team and the certifier so everyone agrees on the problem before we spend time solving it. Then I run the code analysis in detail and work up a performance-based solution, using FDS or PyroSim for smoke modelling and Pathfinder where evacuation is in question. I test the solution against the relevant fire safety criteria and document the methodology and results in the fire engineering report. Once the report is drafted, I brief the approval authority early to get their feedback before formal lodgement, and I stay involved through construction to review any variations or requests

for information from the site team.”

2. Tell me about a time a building design did not meet deemed-to-satisfy provisions and you had to develop a performance-based alternative.

Why they ask

Performance-based design is central to this role. The interviewer is looking for evidence you can reason from first principles, not just apply a rule, and that you can carry a solution through to approval.

How to structure your answer

Use STAR. Set the scene briefly, describe the specific non-compliance, explain the analysis and modelling you did, and finish with the outcome for the project and the approval authority response.

Example answer

“On a mixed-use development, the egress travel distance from an upper floor exceeded the deemed-to-satisfy limit because of the atrium configuration. I confirmed the non-compliance against the NCC and then set up a performance-based assessment, modelling the smoke layer development in the atrium under a design fire using FDS and running the evacuation analysis in Pathfinder. The modelling showed the smoke layer stayed above the tenable height through the evacuation period, so I proposed a solution combining the atrium smoke exhaust with an additional egress path and a declared evacuation sequence. I prepared the fire engineering report setting out the trial design, assumptions and results, and briefed the certifier on the approach before lodgement. The solution was accepted and the project kept the original atrium design, which avoided a costly late redesign of the building core.”

3. A builder on site installs passive fire protection differently to the approved fire engineering report. How do you handle it?

Why they ask

This scenario tests judgement under pressure and your understanding of site reality versus documentation. The interviewer wants to see you protect the fire safety outcome without becoming unworkable on site.

How to structure your answer

Work through it as a judgement sequence: gather facts, assess the safety significance, decide on the technical response, communicate it, and document. Explain how your response would change depending on whether the deviation is minor or material.

Example answer

“First I would go to site and inspect the installation myself rather than rely on a description, because the significance of the deviation depends on what was actually built. I would compare it against the fire engineering report and the relevant Australian Standards, and consider whether the as-built condition still achieves the fire safety criteria or whether it creates a gap. If it is a minor variance with no effect on the design outcome, I would document it as a minor variation and confirm with the certifier that it does not require a formal amendment. If it is material, I would request a hold on covering up that element, identify an equivalent compliant solution or revise the design with additional analysis if needed, and issue a written direction to the builder. Either way I would record the issue in a variation register and keep the certifier informed, so there is a clear trail from site issue to resolution.”

4. How do you explain a complex fire engineering outcome to an architect or a client who is not an engineer?

Why they ask

Client and stakeholder communication questions check whether you can translate technical work into decisions. Fire safety recommendations often compete with design and cost priorities, so clarity matters.

How to structure your answer

Answer with a principle, then a concrete example of how you applied it. Show that you adapt your language and lead with the decision the listener needs to make, not the modelling detail.

Example answer

"I lead with the decision the person needs to make and the practical consequence, then offer the technical detail if they want it. For example, when a client was told a floorplate needed an additional egress stair, I did not start with the modelling results. I explained in plain terms that the current layout could not get occupants out within the required window, that the additional stair resolved it, and what that meant for their net lettable area. Then I walked through the analysis at a high level so they could see the reasoning. In that case the client asked for a second option, so I tested a compliant alternative with different stair positions and presented both side by side with the trade-offs. Being upfront about cost and design implications early meant the recommendation was accepted without a drawn-out dispute."

5. What is your experience with FDS, PyroSim and Pathfinder, and how do you make sure your models are reliable?

Why they ask

Modelling is a core technical skill for this role. The interviewer wants to hear about verification and validation habits, not just software familiarity.

How to structure your answer

Outline the software you have used and the types of problems you have modelled, then focus on your quality assurance approach: inputs, assumptions, sensitivity checks and peer review.

Example answer

"I have used FDS and PyroSim for smoke and fire spread modelling on commercial and mixed-use projects, and Pathfinder for evacuation analysis, including scenarios with phased evacuation and multiple egress routes. I am careful about the quality of the inputs, because a model is only as good as its assumptions. I document the design fire, material properties and boundary conditions with their sources, and I run sensitivity checks on the parameters that matter most, such as heat release rate and ventilation conditions, to see how much the result moves. I also ask a colleague to review the model setup and results before anything goes into a report, because it is easy to carry a small setting error through to a conclusion. Where a result is sensitive or counterintuitive, I say so in the report and explain the reasoning, so the approval authority can follow how the conclusion was reached."

6. Tell me about a project where fire safety requirements clashed with the architect's or client's design ambitions. How did you resolve it?

Why they ask

This probes collaboration and negotiation, and whether you can hold a safety line while remaining constructive. Fire Safety Engineers work across disciplines, so conflict resolution is a real part of the job.

How to structure your answer

Use STAR, and make sure you describe both the safety position and the commercial or design position fairly. Finish with how the relationship was maintained, not just the technical outcome.

Example answer

"On a hotel project, the architect wanted a large open stair connecting two floors for the lobby, which created a potential smoke path between levels. My initial assessment said the configuration did not meet the deemed-to-satisfy provisions, and the architect was concerned that enclosing the stair would ruin the design intent. Rather than just refusing, I modelled the smoke movement to understand the actual risk and tested a couple of alternatives, including a smoke exhaust arrangement and a sprinkler-protected opening. The modelling showed a compliant solution was possible with a smoke exhaust and a specific boundary condition on the opening. I explained the reasoning to the architect in a design coordination meeting, and we agreed on the solution together. The relationship stayed collaborative because I came with options rather than a closed door, and the architect was receptive"

to the trade-off once they understood the safety basis.”