

Performance - Based Design

Project Review and Analysis – Defining the scope including a complete review of the project’s schedule and identification of the “stakeholders” or people who have a vested interest in the project including the engineers, architect, developer/owner, risk manager, facility manager and the Authority Having Jurisdiction. The analysis takes into account factors that affect the actual building itself: use and occupancy; location and geometry; applicable codes and standards; and the extent of the performance effort. The performance-based design approach may extend to the entire building or be limited to a single building design element, such as the structural fire-resistance of a roof member.

Defining the Goals and Objectives – Identifying the design goals of the project as they relate to fire protection. Life safety is the primary objective, but stakeholders may have other goals: property protection or reducing the risk of business interruption. These goals must be stated explicitly and agreed upon by all stakeholders. Specific qualitative criteria can then be established to meet both the needs of the stakeholders and the project design.

Trial Design Development and Evaluation – Developing trial design concepts using different fire protection strategies. Each trial design is then evaluated based on the building and occupant characteristics, the design fire curves and the performance criteria using physical or mathematical models, empirical correlations or other recognized calculation methods. Based on the evaluation, trial designs either pass or fail and the evaluation process continues until one or more designs meet the performance criteria.

Performance-based Code Compliance – Applying the principles of performance-based design to determine alternative methods for satisfying the fire protection and life safety intent of the applicable codes and standards. This process involves the use of scientific modeling tools and methods for determining fire growth, exit times, system activation times, smoke movement and other variables.

Negotiation – Working on behalf of the project’s developer/owner to negotiate approval of the performance-based design plan. The negotiation responsibility also includes maintaining open lines of communication between the architect/engineer, the AHJ and the developer/owner.

Construction Management – Overseeing the installation, testing and commissioning of the life safety systems specified by the performance-based design plan. This function includes project, cost, time and quality management; contract administration and coordination of trades on behalf of the owner, property manager or construction supervisor.

Peer Review – Conducting a peer review of a performance-based design undertaken by others. This work, which may be deemed necessary by a regulatory authority or by a building owner, provides confidence that the design is consistent with acceptable engineering practice and standard of care. Services include defining the scope of the review, participation in the stakeholder’s meeting, review of the design brief, report and supporting documentation.

