

Design Documentation Guidelines

Fire Engineering

Concept Design Phase

Design Process	Deliverables	Commentary
<p>Inputs:</p> <ul style="list-style-type: none"> • Client brief and budget. <input type="checkbox"/> • Client or building owner requirements for property protection, business interruption, insurance, specific building operational requirements. <input type="checkbox"/> • Architectural sketch concept drawings (e.g., bulk and location and typical floors). Include proposed occupancy type and use. <input type="checkbox"/> • Project program. <input type="checkbox"/> • Site plan including details of any neighbouring property boundaries. <input type="checkbox"/> • Site subdivision requirements. <input type="checkbox"/> <p>Design:</p> <ul style="list-style-type: none"> • Review client requirements. <input type="checkbox"/> • Establish design criteria for fire engineering design, i.e., either acceptable solution or alternative solution. <input type="checkbox"/> • Develop fire safety brief including definition of fire safety precautions, egress principles, and neighbouring property protection. <input type="checkbox"/> • Review applicable authority codes and standards. <input type="checkbox"/> 	<p>Drawings:</p> <ul style="list-style-type: none"> • Sketch drawings (may comprise 'marked-up' architectural drawings) including firecell locations, escape routes, etc. <input type="checkbox"/> <p>Specifications:</p> <ul style="list-style-type: none"> • N/A. <p>Reports:</p> <ul style="list-style-type: none"> • Concept fire engineering design report. <input type="checkbox"/> • Describe various design options where applicable. <input type="checkbox"/> • Draft fire engineering design brief (if applicable). <input type="checkbox"/> 	<ol style="list-style-type: none"> 1. Ascertain client brief and to review/consider applicable options. 2. Discuss design options with client. 3. Agree roles and responsibilities. 4. Concept and preliminary design phases are often combined on smaller projects. 5. No co-ordination completed at this stage. 6. For existing buildings, include a broad overview of existing construction and existing fire protection systems, identifying further work required in future stages. 7. On large or complex projects the fire engineer would prepare a fire engineering design brief during this phase.

Design Documentation Guidelines

Fire Engineering

Preliminary Design Phase

Design Process	Deliverables	Commentary
<p>Inputs:</p> <ul style="list-style-type: none"> • Client approval of concept fire engineering (including draft fire engineering design brief if applicable). <input type="checkbox"/> • Design programme. <input type="checkbox"/> • Client approved architectural drawings. <input type="checkbox"/> • Client approved structural drawings. <input type="checkbox"/> • Assess Fire Service New Zealand requirements under Building Code clause C.3.3.9. <input type="checkbox"/> • For existing buildings, list further investigative work required. <input type="checkbox"/> <p>Design:</p> <ul style="list-style-type: none"> • Develop fire engineering concepts and identify special requirements. <input type="checkbox"/> • Confirm escape route requirements and dimensions. <input type="checkbox"/> • Egress analysis including required egress time and available egress time (if applicable). <input type="checkbox"/> • Review structural design and advise on fire rating requirements. <input type="checkbox"/> • Define interface requirements with other services. <input type="checkbox"/> • Identify smoke control measures required (if applicable). <input type="checkbox"/> • Meet with the New Zealand Fire Service in conjunction with the evacuation scheme provider to explain the project, discuss the fire safety provisions provided for fire service use under the New Zealand Building Code clause C3.3.9, and for the evacuation scheme provider to outline the proposed draft evacuation scheme. <input type="checkbox"/> 	<p>Drawings:</p> <p>Layout drawings locating firecells, fire ratings and escape routes, evacuation zones (if applicable). <input type="checkbox"/></p> <p>Specifications:</p> <p>Outline specification of fire engineered features not covered by other designers. <input type="checkbox"/></p> <p>Reports:</p> <p>Preliminary fire engineering design report based on the client approved concept design. <input type="checkbox"/></p> <p>Updated fire engineering design brief (if applicable). <input type="checkbox"/></p>	<ol style="list-style-type: none"> 1. Discuss evacuation philosophy with client, particularly if stage evacuation or evacuation to another part of the building is to be considered. 2. Preliminary fire report is a performance based document specifying features and design requirements that other consultants need to include in their design and documentation. 3. Preliminary fire report is not suitable for building consent. It typically will not include justification for building code compliance (done at developed design). Not all fire engineering design detail required by other parties will be complete at this phase. 4. Fire engineered features that may need an outline specification include protection of structure, measures to control fire or smoke spread, complex interfaces with other building systems including building operational requirements, escape route features and wayfinding.

Design Documentation Guidelines

Fire Engineering

Developed Design Phase

Design Process	Deliverables	Commentary
<p>Inputs:</p> <ul style="list-style-type: none"> • Client approval of preliminary fire engineering design. <input type="checkbox"/> • Client approved architectural drawings. <input type="checkbox"/> • Client approved structural drawings. <input type="checkbox"/> • Fire protection preliminary design. <input type="checkbox"/> • Building services preliminary design. <input type="checkbox"/> • Client to advise specific type and location of storage areas. <input type="checkbox"/> <p>Design:</p> <ul style="list-style-type: none"> • Fire severity analysis. <input type="checkbox"/> • Analysis of structural behaviour in fire (if applicable). <input type="checkbox"/> • Radiation to boundary calculations. <input type="checkbox"/> • Smoke production and extract calculations (if applicable). <input type="checkbox"/> • Detailed egress analysis (if applicable). <input type="checkbox"/> 	<p>Drawings:</p> <ul style="list-style-type: none"> • Drawings showing fire ratings, locations of firecells, fire separations, egress routes and sizes, fire doors, locations for exit signs, etc. <input type="checkbox"/> • Sections as necessary to show fire ratings. <input type="checkbox"/> <p>Specifications:</p> <ul style="list-style-type: none"> • N/A. <input type="checkbox"/> <p>Reports:</p> <ul style="list-style-type: none"> • Updated fire engineering design report. <input type="checkbox"/> • Confirmation from New Zealand Fire Service that the fire safety provisions provided for their use, meet their requirements as per New Zealand Building Code clause C.3.3.9. <input type="checkbox"/> • Fire Service to also advise the evacuation scheme provider that the draft evacuation scheme is acceptable or suggest changes that need to be made to the draft scheme. <input type="checkbox"/> 	<ol style="list-style-type: none"> 1. The fire engineering design would typically be at least 80 percent complete at developed design phase. 2. 'Marked up' architectural drawings may be appropriate for small jobs. However, on large projects it is envisaged that CAD drawings would be produced. CAD drawings assist with interdiscipline co-ordination and allow easy update of fire plans when changes occur to the architectural drawings.

Design Documentation Guidelines

Fire Engineering

Detailed Design Phase

Design Process	Deliverables	Commentary
<p>Inputs:</p> <ul style="list-style-type: none"> • Client approval of developed fire engineering design. <input type="checkbox"/> • Client approved architectural drawings. <input type="checkbox"/> • Client approved structural drawings. <input type="checkbox"/> • Client approved fire protection and building services developed design reports. <input type="checkbox"/> <p>Design:</p> <ul style="list-style-type: none"> • Refine design based on updated architectural and structural design. <input type="checkbox"/> 	<p>Drawings:</p> <ul style="list-style-type: none"> • All fire safety drawings defining fire engineering requirements including plans and sections. <input type="checkbox"/> <p>Specifications:</p> <ul style="list-style-type: none"> • Detailed specification of fire engineered features not covered by other designers. <input type="checkbox"/> <p>Reports:</p> <ul style="list-style-type: none"> • Fire engineering design report, suitable for building consent. <input type="checkbox"/> <p>Calculations:</p> <ul style="list-style-type: none"> • Fire engineering design calculations and supporting documentation to accompany the drawings and design report submitted with the building consent application. Documentation to verify compliance with the building code and client design brief. <input type="checkbox"/> 	<ol style="list-style-type: none"> 1. Detailed design documents to provide a sufficient level of detail to define the design requirements of the fire engineering. (Refer to developed design phase – commentary, note 2 with regard to fire safety drawing production). 2. Co-ordination by other designers. 3. Assumes building consent is lodged after completion of this phase.

Design Documentation Guidelines

Fire Engineering

Construction Design Phase

Design Process	Deliverables	Commentary
<p>Inputs:</p> <ul style="list-style-type: none"> • For construction design phase, drawings for architectural, structural, and other services. <input type="checkbox"/> • Construction programme. <input type="checkbox"/> • Building consent commentary and conditions. <input type="checkbox"/> <p>Design:</p> <ul style="list-style-type: none"> • Minor revisions and so on are to take account of queries raised by the territorial authority during the consent process. <input type="checkbox"/> 	<p>Drawings:</p> <ul style="list-style-type: none"> • Fire engineering detailed design drawings updated and issued 'for construction'. <input type="checkbox"/> <p>Reports:</p> <ul style="list-style-type: none"> • Fire engineering design report, as issued for building consent, issued 'for construction'. <input type="checkbox"/> 	<ol style="list-style-type: none"> 1. Report and drawings are required to incorporate building consent issues and outcomes from design coordination into the 'for construction' fire engineering design. 2. Specific timing of the 'for construction' milestone will be project specific. Agreement with all parties will be required on projects in which a constructor also has design responsibility or where investigative work is required during the construction phase for alteration of existing buildings.