engineering new zealand
te ao rangahau

PRACTICE NOTE 22
GUIDELINES FOR DOCUMENTING AND COORDINATING FIRE SAFETY DESIGNS

Version 2, April 2025

FOREWORD

This document is published as Practice Note 22 Version 2 by Engineering New Zealand. It serves as a guide to good practice for implementing fire design within the overall building design documentation, emphasising the importance of communication and coordination between all disciplines.

This Practice Note is not a substitute for professional or legal advice and should not be relied upon to establish compliance with the Building Code. It is not an acceptable solution in terms of the Building Act and may be updated from time to time.

Version 2 of this Practice Note addresses corrections required after revisions to the Building Code 'Protection from Fire' acceptable solutions and verification methods. It also provides additional guidance on communication, coordination and defining responsibilities to enhance the quality of fire design documentation.

Coordination is essential for fire safety design:

1. The fire report is a strategic document that touches on many aspects of the building design.
2. The detailed design and specification of the fire safety features required in the building are typically produced by various consultants (eg the Architect/Architectural designer, Structural designer, Fire System designer, Passive System designers, Mechanical designer, Electrical Systems designer, Façade designer, other Building Services designers, etc.).
3. The Building Consent Application requires submission of the fire safety design documents, along with all the drawings and specifications to construct the building.
4. Ultimately, safety is measured in the effective implementation and performance of the built fire protection systems, not just the documentation provided in the fire report.

CONTENTS

INTRODUCTION

Version 1 of Practice Note 22 (PN22 V1) was published in September 2011 to address concerns over the quality of fire design documentation and its integration into the plans and specifications produced by the building Design team. Significant changes in building design methodologies, including increased use of digital design tools such as Building Information Modelling (BIM) have improved coordination. However, this improvement has been offset by growing building complexity and new technologies.

This Practice Note aims to establish good practice guidelines to improve fire design documentation quality, emphasising communication and coordination. Additionally, it addresses necessary corrections following revisions to the Building Code *Protection from Fire Acceptable Solutions and Verification Methods* and outlines the likely expectations of Building Consent Authorities (BCAs).

It is important to recognise that obtaining building consent is just one milestone in the broader objective of constructing a building. Consequently, the fire design documentation should be comprehensible to a wide range of stakeholders, including the Design team, design reviewers, builders, Evacuation consultants and the Building Owner.

Effective communication is critical across all design disciplines, particularly for fire design, as its requirements are integrated into the plans and specifications produced by other Design team members. Clear communication and coordination helps to ensure that fire requirements are accurately captured and reflected in the documentation.

Version 2 has been developed by Engineering New Zealand with volunteers from the Ministry of Business, Innovation and Employment (MBIE), Auckland Council (AC), Christchurch City Council (CCC), the Society for Fire Protection Engineers New Zealand Chapter (SFPE NZ), the Institution of Fire Engineers New Zealand Branch (IFE), Fire and Emergency New Zealand (FENZ), Fire Protection Association New Zealand (FPANZ), the New Zealand Institute of Architects (NZIA), Architectural Designers New Zealand (ADNZ), Structural Engineers Society (SESOC) as well as representatives from Passive Fire engineers/consultants and Façade engineers.

The Ministry of Business, Innovation and Employment (MBIE) is pleased to support Engineering New Zealand developing this Practice Note to improve the way fire safety designs are documented and coordinated between technical disciplines.

NOTE: Appendix A provides definitions for highlighted terms used in this document (highlighted on their first occurrence only).

PURPOSE OF THIS PRACTICE NOTE

This document is a guide for project Design teams for good practice in coordinating and documenting fire design in building projects.

Applicable to both new buildings and alterations to existing buildings, this Practice Note describes the documentation typically expected to establish compliance, recognising that the required level of verification detail and coordination will vary depending on the complexity of the proposed building work.

Complementing the Construction Industry Council (CIC) Design Documentation Guidelines, the Society of Fire Protection Engineers (SFPE) Engineering Guide to Performance Based Fire Protection and the International Fire Engineering Guidelines, this Practice Note addresses various aspects of fire design.

Comprehensive design documentation facilitates the processing of Building Consent Applications by Building Consent Authorities (BCAs). This Practice Note recommends, as good practice, the use of Design Coordination Statements and a Design Coordination Table (as introduced in this version of this Practice Note) in consent applications to demonstrate effective collaboration among design disciplines. This enhances the quality of the application and expedites its processing for a more efficient and timely consent process.

FIRE DESIGN PROCESS

Early coordination is essential in the fire design process and should start at the project initiation stage. It is strongly recommended that the client engages a Lead consultant to oversee fire design coordination.

At the project initiation stage, the Lead consultant, if engaged, should identify the required expertise, confirm the Design team, and clearly define roles and responsibilities. At the concept stage, ideally all relevant design elements are addressed by the identified parties. The Fire designer's role at the concept stage is to identify the compliance pathway and communicate key fire design requirements to the Design team. Where no Lead consultant is appointed, the Design team will need to establish how coordination is to be achieved.

As the design progresses the Fire designer will identify the fire safety performance requirements and develop the fire report in conjunction with the Design team. All changes to the design should be coordinated with the Design team and changes reflected in updates to the fire report and other relevant documentation. Regular meetings between all relevant disciplines to discuss and resolve coordination issues are recommended throughout the design stage.

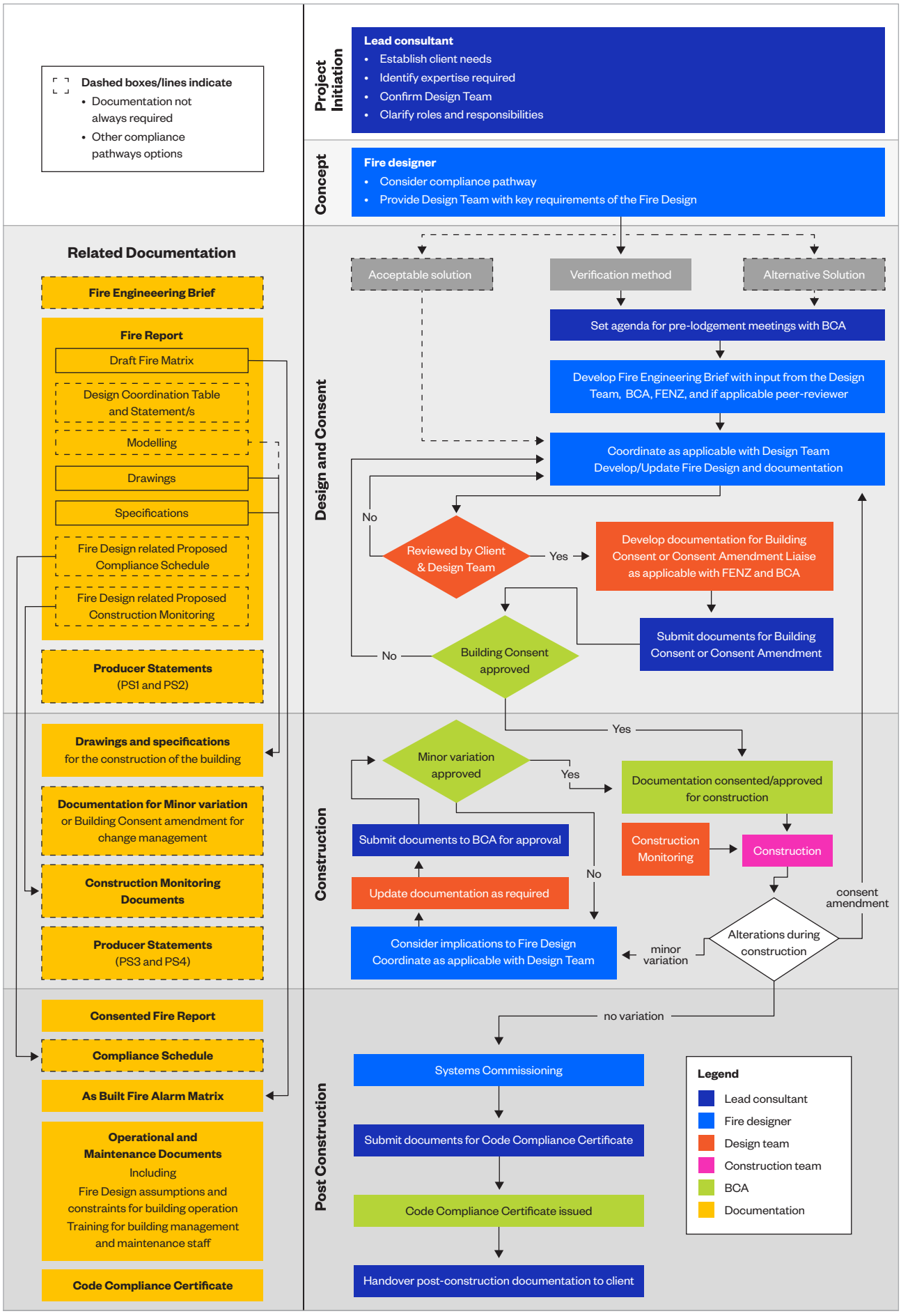
The fire design documentation typically focuses specifically on fire performance and is not sufficient on its own for construction purposes. It can be a valuable supplement to documents prepared by other consultants. For example, while the fire engineering design may require fire rated walls at certain locations, the walls' specification and construction details will be covered in the architectural documentation. Similarly, the fire engineering design might require a particular fire detection system, but the detailed specification for this system would be prepared by the Fire protection systems designer or a fire protection contractor. Other important structural details such as vertical deflection head allowances to the fire separation walls, thermal movement allowances in steel connections or limiting temperatures for intumescent coatings will be provided in structural drawings.

After the building consent has been issued any proposed changes occurring during construction should be coordinated with the Design team and the BCA. While this is not typically the responsibility of the Fire designer, it is essential that fire design documentation is included in the Operational and Maintenance documents handed over to the Building Owner. This assists in the ongoing management and maintenance of the building.

The fire design process is iterative, and requires ongoing coordination between the Fire designer and the Design team to ensure a consistent and compliant design.

Figure 1 illustrates an example of the integration of fire design documentation throughout the stages of building design and construction. Not all projects will follow this process, and not all documentation will be applicable. The dashed boxes and flow chart lines indicate alternative pathways and documentation that may not be required for all projects. This example assumes that a Lead consultant has been engaged.

Figure 1: Fire Design Process – Example



FIRE DESIGN COORDINATION

Fire design coordination is a shared responsibility involving multiple disciplines within the Design team. In addition to the Fire designer, this encompasses various disciplines such as Passive system design, Fire system design (active systems), Electrical Systems design (emergency lighting and power needs to any active fire systems), Building Services design (smoke control), Structural design (structural performance during fire) and Architectural design. The Design team is responsible for integrating all aspects of fire safety into the design and providing consistent information to support the Compliance Schedule.

If appointed, the Lead consultant or Lead designer typically oversees the coordination process. The Fire designer's role is to support the project's client and Design team with coordination and checking of fire-related design matters, particularly when other disciplines specify products and systems to comply with the Fire designer's performance requirements.

The Design Coordination Statement was introduced in Version 1 of this Practice Note. Since its introduction, this example statement has been used by Fire designers and other design disciplines as a useful means to demonstrate that coordination has occurred and how each designer has integrated fire safety requirements into their expertise area. These statements have typically been modified from the example statement as needed to suit individual circumstances and purposes.

The Design Coordination Table

Version 2 of this Practice Note introduces examples of a Design Coordination Table. This is a tool that can be used to record and summarise the design coordination process and provide evidence that fire design coordination has been completed for essential design elements. The use of this Table and corresponding Design Coordination Statements can serve as a record of coordination efforts and their outcomes. Its use can also enhance transparency, facilitate better communication among the Design team, and provide a clear audit trail of design coordination activities. This approach can improve the design process and contribute to the quality and compliance of the final constructed building.

Tables 1 and 2 below provide examples of Design Coordination Tables that illustrate two approaches to fire design implementation. The first table is intended for buildings with basic fire safety features, while the second includes additional fire safety features typically representing a more complex fire engineering design.

These are example tables only and do not provide an exhaustive list of the many fire safety features that could be included in a building design. They provide examples of key fire safety features that may be included within a project and describes the different approaches to the design and review of each system depending on the complexity of the project. Many of these design elements will also be specified systems and will need their performance, maintenance and inspection procedures identified as part of the Compliance Schedule (refer to Section 9).

Completing the Design Coordination Table would be the responsibility of the entire Design team, with the Fire designer best suited to initiate the table by identifying the key fire protection elements of the design and their performance requirements (columns one and two of the following example tables). It would then be the responsibility of the specific designer to identify and update the additional coordination information for each identified element. This assignment should align with each designer's field of expertise. Once completed, the Design Coordination Table can then be referenced by individual designers in their Design Coordination Statement.

NOTE: Modification of Design Coordination Tables

Both Design Coordination Table examples can be modified for an individual project depending on the project scope and complexity, and the need of the Design team.

For each project the discipline responsible for each item in the Table might vary. This could be a result of the complexity of the project and the expertise and experience of those on the Design team.

The following examples can be used as templates to adapt as appropriate to the specific requirements of a project. Note the use of 'XXXX' in these tables is to indicate where the relevant standard year should be identified, 'YYY' where report/drawing/specification names or numbers should be added, and 'Z' to indicate amendment number.

Example table 1: Design Coordination Table for a building with basic fire safety features

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent review of design element/ construction
Fire detection and alarm system					
NZS 4512:XXXX	Design build – fire protection contractor or independent Fire System designer	Performance requirements outlined in fire report. Location of main fire panel identified	Fire Report FR YYY	Limited coordination for consent. Independent certification to the consented fire report by the fire alarm inspector upon completion.	Independent inspection prior to certification
Fire rated construction					
AS 1530.4:XXXX	Architect/ Architectural designer	Wall schedule details specify fire rated system (eg manufacturer system and manufacturer system specification)	Architectural drawings YYY showing fire rated partition. Manufacturers system specification from Technical Manual submitted as part of the architectural design information.	Fire designer spot check that fire separations are shown in the appropriate locations on architectural drawings and the wall schedule identifies the appropriate fire rating and a specific system. Fire designer also spot check the details related to fire rated elements.	PS3 provided by installers and inspection by BCA inspectors
Fire door					
NZS 4520:XXXX	Architect/ Architectural designer	Doors and windows schedule specifies fire door location, fire rating, hardware, etc.	Architectural drawings/ specification Masterspec YYY. Fire door supplier certification.	Fire designer spot check that the fire door(s) specified is shown in the appropriate location on architectural drawings and has a fire test certificate providing evidence of compliance with the door schedule which identifies the appropriate fire rating.	Fire door tags installed on door confirming fire report performance requirement

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent review of design element/ construction
Passive fire stops including seismic joints					
AS 1530.4:XXXX and AS 4072.1:XXXX	Nominated contractor	Architectural and passive fire documentation sets out requirements for any fire stopping to be installed to meet fire rating identified within the fire report	Passive fire specification. Refer to YYY's test report/assessment numbers test lab number YYY.	No further checking required before consent	Contractor Quality Management System states installation methodology and process for documenting the installation
Exit signs					
F8/AS1 Amdt Z	Electrical designer	Signage locations identified on electrical drawings indicating egress routes identified within fire report	Electrical design and plans. Electrical designer PS1.	Fire designer confirm that signage locations have been coordinated with egress routes.	PS3 provided by installers and inspection by BCA inspectors
Emergency lighting					
F6/AS1 Amdt Z	Electrical designer	Electrical design shows locations of light fittings and those identified as emergency lighting.	Electrical design and plans. Electrical designer PS1.	Fire designer spot check that emergency lighting meets fire report requirements.	PS3 provided by installers and inspection by BCA inspectors

Example table 2: Design Coordination Table for a building representing a more complex fire engineered design

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent peer review provided including coordination checks
Fire sprinkler system					
NZS 4541:XXXX and C/AS2 Appendix B modifications	Fire protection system designer	Fire protection design. FENZ inlet location approval obtained.	Fire protection specification FSXXX- SPE and drawings FSXXX-XX	Fire protection system designer review fire report and confirm that their design incorporates, and is consistent with, the fire design requirements and meets design specification. Fire designer review fire system design documentation and confirm that the design intent is met. [For example, checking window sprinklers are provided and have the appropriate valving configuration].	Independent review by the Sprinkler System Certifier prior to installation and an independent inspection prior to certification
Fire detection and alarm system					
NZS 4512:XXXX with the exception of the concealed space that is 900mm high, where no detection is to be provided.	Fire protection system designer	Fire protection design FENZ Fire Alarm display location approval obtained. Explanation of basis of NZS4512 exception in fire report.	Fire protection specification FSXXX- SPE and drawings FSXXX-XX	Fire protection system designer review fire report and confirm that their design incorporates, and is consistent with, the fire design requirements including notes where there is a concealed space with no fire detection. Fire designer review fire system design documentation and confirm that the design intent is met.	Independent inspection prior to certification

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent peer review provided including coordination checks
Fire hydrant system					
NZS 4510:XXXX Extended hose run distances and outlets spacing approved by FENZ.	Fire protection system designer	Fire report includes basis of extended hose runs and any conditions. FENZ approval obtained.	Fire protection specification FSXXX- SPE and drawings FSXXX-XX	Fire protection system designer review fire report and confirm that their design incorporates, and is consistent with, the fire design requirements including notes on hose run distances and outlet locations. The Fire designer review fire system design documentation and confirm that the design intent is met.	Independent review by the Hydrant System Certifier and an independent inspection prior to certification
Fire rated constructions					
AS 1530.4:XXXX	Architectural designer	Wall schedule details specific fire rated system (eg manufacturer system and manufacturer system specification)	Architectural drawings YYY (fire rated partitions) and architectural specifications YYY which include supporting technical manufacturer's information	Fire designer spot check that fire separations are shown in the appropriate locations on architectural drawings and the wall schedule identifies the appropriate fire rating and a specific system. Fire designer spot check details related to fire rated elements.	Fire PS2 spot check only
Fire doors and smoke doors					
NZS 4520:XXXX	Architectural designer	Door and window schedule. Manufacturer/ supplier supporting documentation and certification YYY.	Architectural drawings (fire door locations and identifiers) and architectural specifications YYY	Fire designer spot check that fire doors specified are shown in the appropriate locations on architectural drawings and a fire test certificate provides evidence of compliance with the door schedule which identifies the appropriate fire rating.	Fire PS2 spot check only

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent peer review provided including coordination checks
Façade fire details including cavity barriers					
Curtain wall system to AS 5113: XXXX EW classification	Façade designer	Design Product certification and fire test reports	Façade package and specification. AS 5113:XXXX EW classification test certificate and associated assessment.	Façade designer confirm façade design within scope of the test certificate and associated laboratory assessment	Fire PS2 – Review evidence
Smoke control systems – stair pressurisation system					
AS1668.1: XXXX	Mechanical designer	Mechanical design details system operation, pressure differential calculations, basis of design and integration with fire safety systems	Mechanical specification	Fire designer confirm stair pressurisation is included in the mechanical design and aligns with fire design requirements, ie numbers of doors open. Mechanical designer to check the design for compliance with standard and fire design specification.	Mechanical PS2
Passive fire stops including seismic joints					
AS1530.4: XXXX and AS4072:XXXX	Passive systems designer (or nominated system designer)	Architectural and passive fire specification sets out requirements for any fire stopping to be installed to meet fire rating identified within the fire report. Design details, product certifications and testing.	Passive fire specification. Refer to XXXX's test report/ assessment numbers, test lab number YYY.	No further checking required before consent.	Fire PS2 – Review evidence
Exit signs					
NZBC clause F8	Electrical designer	Signage locations identified on electrical drawings indicating egress routes identified within the fire report. Electrical designer PS1	Electrical drawings and specifications	Fire designer confirm signage locations have been coordinated with egress routes	Electrical PS2

Performance requirement	Discipline responsible for design or specification	Evidence for proposed system to support building consent	Location of evidence	How design coordination is achieved	Independent peer review provided including coordination checks
Emergency lighting					
NZBC clause F6	Electrical designer	Electrical design shows locations of light fittings and those identified as emergency lighting. Electrical designer PS1	Electrical drawings and specification	Electrical designer spot check emergency lighting meets fire report requirements	Electrical PS2
Surface finishes					
NZBC group number requirements eg GN1-S	Architect/ Architectural designer	Surface finish test certificates for all surface linings	Architectural specification. Surface finish test certificates for surface linings.	Fire designer spot check critical locations of surface linings materials to confirm that the Architect/ Architectural designer's specification meets the fire report performance specification	Fire PS2 – spot check only
Fire protection of structural elements					
Required fire resistance rating FRR 30/-/- to AS 1530.4:XXXX	Fire designer	FRR is specified for different building elements.	Fire Report FR YYY.	Fire designer to check that the FRRS in the Structural Design Features Report are consistent with the fire engineering design of the building	Fire PS2 – spot check only
	Structural designer	Fire rated structural elements and means of achieving FRR identified. Structural PS1 (B1).	Design Features Report. Structural drawings.	Structural designer spot check architectural design to confirm the structural elements have the required FRR.	Structural PS2
	Architectural designer	If not shown on the structural drawings, fire protection of structural elements identified	Architectural drawings	Architectural designer check for consistency with the fire report and the Design Features Report.	

NOTE: Design Coordination Table

Not all fire systems that may be provided in fire designs have been included in the example tables. If the following systems are present, they should be included in the Design Coordination Table:

Fire curtains, Fire shutters, Smoke curtains, Fire-resistant glazing, Smoke control via mechanical extraction, Lift fire doors and controls, Fire dampers, anything additional required to support the proposed fire strategy.

The term 'spot check' used in the example tables is as referred to in the SFPE Construction Monitoring Guide, ie 'Third party construction monitoring (eg by a designer or BCA) is not intended to check every element on-site. It is a 'spot checking' task where random samples of critical work are checked. The quality of these third party checks is limited by the quantity and duration of inspections and the number of work samples checked.'

Design Coordination Statement example

The following example text for a Design Coordination Statement has been adapted from the example given in PN22 Version 1 to include reference to the Design Coordination Table. It gives alternative text for the Fire designer and various other disciplines. It is expected that the dates and revisions of the drawings, specifications, and documents listed in the coordination statement align with those in the consent documents.

NOTE: Modification of Design Coordination Statements

It is expected that this example of a Design Coordination Statement would be further modified to suit individual designer's circumstances and purposes.

Design Coordination Statement Example

This Design Coordination Statement is prepared in reference to the Engineering New Zealand Practice Note 22 Guidelines for Documenting and Coordinating Fire Safety Designs and intended to accompany the documents submitted in the application for building consent.

We confirm that after exercising the degree of skill, care and diligence reasonably expected of a competent [discipline] designer,

[Fire Designer: We have reviewed the drawings, specifications and other documents produced by the various designers as listed on the attached document schedules for the purpose of fire safety design coordination, to determine that the fire safety design's intent for compliance with the building code is correctly shown on these documents. This review does not relieve other designers of their responsibilities for correctly interpreting the fire design or from ensuring the fire safety requirements in their documents are correct and complete].

[Other Designer: We have received, read and understood the implications of the fire safety documents listed on this Coordination Statement to the extent that affects our scope of work. The drawings, specifications and other documents produced by us as listed on the attached document schedules have been reviewed by us within the context of the fire safety design to determine that the relevant fire safety design requirements for compliance with the building code are correctly shown in our working drawings and specifications.].

This Design Coordination Statement is provided specifically for building code compliance only. A record of coordination has been documented in the attached Design Coordination Table.

Signed:

Company:

Name of Signature on behalf of the Company:

Date:

Design teams can effectively track and document their coordination efforts by using a Design Coordination Table and Design Coordination Statements. This approach helps to properly address and integrate essential fire safety elements into the overall design. It promotes transparency, facilitates clear communication among design team members, and provides evidence of appropriate communication. Additionally, these help maintain a record of design decisions and their implementation throughout the project lifecycle.

Coordinating other compliance requirements

While Building Consent Applications primarily focus on meeting the Building Act and Building Code requirements, other legal obligations may also apply to certain projects. These can include the Hazardous Substances and New Organisms Act, the Health and Safety at Work Act, and the Fire and Emergency New Zealand (Fire Safety, Evacuation Procedures, and Evacuation Schemes) Regulations. Additional legislation may also have requirements that impact building design features in specific circumstances.

Although these requirements might not directly affect obtaining a building consent and may fall outside of a designer's scope of works, they should be considered during the coordination process. Early involvement of specialist consultants may be necessary, especially when potential conflicts arise between different legislative requirements and obligations.

Where there may be uncertainty or ambiguity, it is important for designers to clearly identify which requirements fall within or outside their scope of responsibility. This provides stakeholders with essential information, allowing them to address any scope limitations promptly and effectively.

The Building Act purpose clearly defines the need to ensure that Owners, designers, builders, and BCAs are each accountable for their role in ensuring that the necessary building consents and other approvals are obtained for proposed building work; and plans and specifications are sufficient to result in building work that (if built to those plans and specifications) complies with the Building Code; and building work for which a building consent is issued complies with that building consent; and building work for which a building consent is not required complies with the Building Code.

By adopting a comprehensive approach to compliance coordination, Design teams can more easily fulfil all relevant legal and regulatory requirements, reducing the risk of delays or complications later in the development process.

FIRE DESIGN DOCUMENTATION

This section outlines the content and preferred format for fire design documentation. This documentation serves as an important communication tool, conveying essential information about the project, fire design, proposed solutions, and verification of compliance with design objectives.

Whether using an acceptable solution, the Verification Method C/VM2 or an alternative solution, the design documentation should be specific to the building work proposed. The building consent documentation should include plans and specifications to establish and demonstrate compliance with the Building Code, may outline any requirements for inspections during construction and support the development of the Compliance Schedule requirements for any specified systems.

NOTE: Fire design solutions

While Fire Design documentation is typically prepared to demonstrate regulatory compliance, it often serves additional purposes. When a Building Owner or occupier's brief exceeds minimum Building Code requirements (eg property protection) the design documentation may also show how these additional requirements have been satisfied.

The fire design documentation is provided for at least three purposes:

1. Design process: The documentation guides the inclusion of fire safety requirements in design and construction documents provided by Architects/Architectural designers, other professionals, or the Building Owner
2. Building consent approval: It provides justification that the fire safety design complies with the Building Code.
3. Building construction and Code Compliance certification.

The following table outlines the typical fire design documentation items.

Table 1: Typical Fire Design Documentation and order

Item	Description	Design Documentation
A	Building description and use	Fire Engineering Brief where applicable. Fire Engineering Report Plans and design specifications, as verification of the Building Code compliance Building Code compliance path/methodology
B	Fire engineering design philosophy	
C	Means of escape	
D	Fire safety systems	
E	Control of internal spread of fire and smoke	
F	Control of external spread of fire	
G	Fire and Emergency New Zealand access and fire-fighting facilities	
H	Construction observations. CM level, specified systems and number of inspections if applicable	Fire designer, or other designer's inspections required during construction
I	Compliance Schedule – fire items	List of Specified Systems, compliance Standards and maintenance Standards Where specified systems are interfaced, Fire Matrix and commissioning inspections.
J	Miscellaneous information	Other information relating to Building Code compliance
	Information for Building Owner/Property Manager	Information supporting the building remaining compliant in use Building Owner's responsibilities/duties

- Items A to G in Table 1 are broadly aligned with the following categorisation of fire safety subsystems from the International Fire Engineering Guidelines: Fire Initiation, Development and Control; Smoke Development, Spread and Control; Fire Spread, Impact and Control; Fire Detection, Warning and Suppression; Occupant Evacuation and Control; Fire and Emergency New Zealand (FENZ) Intervention.
- Items A to J relate to the Building Code compliance.
- Items H and I are the written proposals for the Owner's Representative inspection while the building work is under construction. Where the Owner's Representative applicant undertakes inspections throughout the work, advice on those inspections should also be included in the Building Consent documentation.
- Item J covers miscellaneous information such as documenting alternative solution design, modification to the Standards applied, or waiver justification.
- Item K covers information not typically required to demonstrate Building Code compliance but may be required
  by the Building Owner/property manager to ensure that the building remains compliant in use.
- Table B1 in Appendix B (pages 29–45) gives detailed information on the content of the Fire designer's documentation as outlined above and describes the form that design documentation may take.

NOTE: Fire Design Documentation Table

The Fire Design documentation table should be used as a guide to the potential Fire design elements that could be relevant for a project. The number of elements and the level of detail required will vary based on the project's complexity and the design approach used.

BCA REQUIREMENTS

The BCA needs to be satisfied on reasonable grounds that Building Consent documentation demonstrates compliance with the Building Code. The BCA may undertake additional reviews if they consider there is evidence of insufficient design coordination carried out by the designers. The extent of review and the level of coordination checking involved should be agreed upon with the BCA at the early stages of a Building Consent Application and/or during any pre-application process.

Where documentation had been amended during the Building Consent process, including as a result of "Requests For Information", the BCA needs to satisfy itself that the submitted "plans and specifications" continues to demonstrate compliance and as such may request updated Design Coordination Statements if they have been provided in support of the Building Consent Application.

When a PS2 design review is provided in support of a Building Consent Application, it is good practice to include an independent coordination check by the PS2 author to confirm that the design meets relevant performance requirements and standards.

Early communication is recommended between the PS2 reviewer and the BCA to agree to scope and expectations for acceptance and to avoid repetitive reviews which may result in delaying the consenting process.

MONITORING THE BUILDING WORK DURING CONSTRUCTION

There is increasing awareness of the importance of involving Fire designers during the construction phase to verify the physical construction and systems providing the overall fire safety solution have been correctly incorporated into the building.

NOTE: Fire Designers Role In Monitoring The Building Work

It is recommended that the Fire designer is involved in the construction monitoring process. The extent of this involvement should correspond to the complexity of the fire design solution, and the Fire designer should advise the Building Owner and Design team of any monitoring they will undertake. As the Fire designer understands the Fire design better than anyone, they are therefore best equipped to support the Design team in its correct implementation of the Fire design in accordance with the plans and specifications. The Fire designer's presence on site can also facilitate the prompt resolution of any issues that may arise and provide expert advice on any necessary variations to the building consent.

To be consistent with the Building Act requirements, the design documentation should enable the Building Owner and BCA to identify those aspects of the fire safety systems that require specific monitoring, testing and commissioning during each construction phase. In particular, the requirements for interface checking and performance criteria are required, as coordination between the parts of the overall fire safety system need to be clearly identified. It is recommended that these processes are coordinated with FENZ and/or the BCA to facilitate their attendance if required.

It is recommended that clear responsibilities are established for any construction monitoring. The relevant designer is best placed to advise on the need for and extent of construction monitoring activities within their remit.

Examples of on-site construction monitoring by the building consent applicant related to the fire design are:

a. Observations while the work is in progress

Checking the work at key stages increases confidence that the plans and specifications are correctly followed. Observations must take place before critical work is covered up, as well as from time to time and, most importantly, on completion. This checks that work done by others has not adversely affected the integrity of the fire design, for example, any penetrations through firewalls for building services.

b. Commissioning and acceptance testing

Commissioning and acceptance testing is required for many fire protection systems. The design documentation should outline the commissioning and acceptance testing required to verify that the systems comply with the approved consent. This should include interface testing. In some cases, the testing required may be from relevant Standards, while in others it may be unique to the specific design proposals.

The following Standards contain inspection requirements for commissioning and acceptance testing; NZS 4512 for fire detection and alarm systems, NZS 4541 for fire sprinkler systems, and NZS 4510 for hydrant systems. These Standards require inspections to be performed by appropriately qualified and experienced third-party inspectors. A Certificate of Completion is required for a fire alarm system from a qualified alarm inspector, and a Certificate of Compliance is required for sprinkler and hydrant systems from a System Certifier. If the consented system departs from the standards, a Statement of Compliance may be issued instead confirming compliance with the approved consent.

COMPLIANCE SCHEDULE REQUIREMENTS

The Building Act requires that any building with a specified system has a Compliance Schedule (see MBIE Compliance Schedule Handbook for a list of specified systems). Generally, these are systems whose failure to operate correctly could affect the building users' health or safety. Compliance Schedules set out the performance standards for the specified systems and the Building Owners' obligations for inspecting and maintaining any specified systems to ensure they continue to operate as designed.

If the fire design includes, or impacts on, a specified system, the specified system should be identified in the design documentation, along with the proposed performance standards and procedures for inspection and routine maintenance to ensure it remains in good working order. The requirements should be specific to the building's specified systems.

As the Compliance Schedule is required to list all specified systems as defined by the Building Act, not just those associated with fire safety, a Fire designer should provide input into the Compliance Schedule but is unlikely to compile the entire schedule.

The BCA will consider the building consent applicant's proposals for inspecting and maintaining any specified systems. If it agrees they are appropriate, the BCA will include them on the Compliance Schedule issued to the Building Owner when the building work is complete, along with the Code Compliance Certificate and Compliance Schedule Statement.

Further guidance on Compliance Schedules and the building warrant of fitness regime can be found in the MBIE Compliance Schedule Handbook[1] and the MBIE Exemplar Compliance Schedule[2].

NOTE: Building features not required on the Compliance Schedule

Many aspects of construction and systems provided to support code compliance will be required to undergo regular inspection and maintenance to comply with the Building Act and Code requirements. However not all relevant systems and building features may be required to be documented on the Compliance Schedule.

Where there are building features that require ongoing inspection and maintenance but are not required to feature on the Compliance Schedule, a separate set of plans and specifications may be helpful to ensure that these features are not forgotten and overlooked by the Building Owner or occupiers. For example, not all fire and smoke separations may be required to be identified on the building's compliance schedules.

Therefore two discrete sets of drawings may be beneficial to distinguish between what needs to be shown and inspected as part of the annual BWOF, as well as those that require regular inspection and maintenance of building materials and systems to maintain ongoing building wide performance.

1 Compliance Schedule Handbook | First edition | Amendment 3
2 Exemplar Compliance Schedule (building.govt.nz)

REFERENCES

1. *Association of Building Compliance, Code of Practice for Electromechanical Controlled Locking Devices on Egress Doors*, June 2018.
2. Australian Building Codes Board (ABCB), *International Fire Engineering Guidelines 2005, Australia*, July 2021 update.
3. Construction Industry Council, New Zealand, *Design Documentation Guidelines – Fire Engineering/Fire Protection*; 2023.
4. Engineering New Zealand and ACENZ, *Guideline on the Briefing and Engagement for Consulting Engineering Services*, 2004.
5. Engineering New Zealand, *IPENZ Hot Topics: Report and Recommendations* - Fire Engineering Advisory Taskforce, 2007.
6. Engineering New Zealand, *Practice Note 1 Guidelines on Producer Statements*, 2014.
7. Engineering New Zealand, *Practice Note 4 Health and Safety by Design*, 2023.
8. Engineering New Zealand, *Practice Note 22* Version 1, 2011.
9. FPA New Zealand, *Code of Practice for the integration of Building Fire Safety Systems with other Services*, COP-04 Version 1.0, 2022.
10. FPA New Zealand, Code of Practice for the Specification and Application of Intumescent Coatings for the Fire Protection of Structural Steel, COP-03 Version 2.0, 2022.
11. Ministry of Business, Innovation and Employment, *Compliance Schedule Handbook, Amendment 3*, 2014.
12. Ministry of Business, Innovation and Employment, *Exemplar Compliance Schedule*, 2021.
13. Ministry of Business, Innovation and Employment, *Guidance to building consent amendments: Minor variations. Building Performance*.
14. Ministry of Business, Innovation and Employment, *Requesting information about means of escape from fire for existing buildings*.
15. New Zealand Construction Industry Council. *NZCIC guidelines for best practices in the construction industry*. Retrieved from www.nzcic.org.nz/guidelines
16. Society of Fire Protection Engineers, *Code Officials Guide to Performance Based Design Review*, Quincy, MA, USA, 2007.
17. Society of Fire Protection (NZ), *Construction Monitoring Guide – Fire Engineering V1.0*, 2021.
18. Society of Fire Protection Engineers, *SFPE Engineering Guide to Performance-Based Fire Protection*, 2nd edition, Quincy, MA, USA, 2007.
19. Standards New Zealand, *NZS 4512:2021 Fire detection and alarm systems in buildings*, 2021.

APPENDIX A
DEFINITIONS

Acceptable solution	A prescriptive design method that when followed, results in compliance with the Building Code. Acceptable Solutions C/AS1 and C/AS2 provide a means of compliance with the Building Code clauses C1 - C6 Protection from Fire, as defined in the Building Act 2004 S22. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306347
Alternative solution	A building solution that demonstrates compliance with the Building Code but differs partially or entirely from the acceptable solutions or verification methods. www.building.govt.nz/building-code-compliance/c-protection-from-fire/c-clauses-c1-c6/alternative-solutions-building-code-c-protection-fire
ANARP	'As nearly as is reasonably practicable,' is the threshold that applies to all Building Code clauses that a building does not fully comply with following an alteration. It ensures that efforts are made to align as closely as possible with the Building Code without imposing unreasonable or impractical burdens on the applicant. www.building.govt.nz/building-code-compliance/b-stability/b1-structure/altering-existing-building/demonstrating-and-assessing-compliance-for-buildings-undergoing-alterations/step-3-applicants-assess-anarp-for-outstanding-fire-and-accessibility-building-code-clauses
Architect/Architectural designer	Person or entity who plans, designs and advises on the construction and alteration of buildings. Design will include the shape, form, and location of the building, how the building will meet its functional, cultural, social, and aesthetic purposes and requirements, and specifying the majority of components, materials and details to be used for construction, including for walls, floors, roofs, ceilings, windows and doors, finishes and claddings. They are often nominated by the client as the Lead designer.
BIM	Building Information Modelling is a workflow process based around models used for the planning, design, construction, and management of building and infrastructure projects.
Building Act 2004 (the Building Act)	The principal legislation dealing with building controls in New Zealand. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html
Building Code	As defined in the Building Act 2004 S400. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM309067
Building Consent	Consent to carry out building work granted by a BCA under section 49 of the Building Act 2004 S49. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306385
Building Consent Authority (BCA)	As defined in the Building Act 2004 S273 (a). www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM308255
Building Services designer	Person or entity who designs systems that support the function of the building which includes, but is not limited to, the following systems: fire protection systems, electrical systems, mechanical systems, hydraulic systems, security systems, lift systems, gas systems, automated storage systems. The designers include, but is not limited to: Fire System designer, Electrical Systems designer, Mechanical Systems designer, Hydraulic Systems designer, Security systems designer. See definitions of these designers for additional information.
Building Work	As defined in the Building Act 2004 S7. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306054
Civil designer	Person or entity who designs the site infrastructure such as roading, parking, site water supply.
Code Compliance Certificate	As defined in the Building Act 2004 S95. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306852
Compliance Schedule	As defined in the Building Act 2004 S100. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306860
Construction Team	The building contractors working on the site; plumbing, electrical, wallboard, carpentry, electrical, mechanical, fire protection, passive fire systems, etc. as well as the Design team.

Design documentation	Information required to be submitted with the Building Consent Application detailing the building work proposals and justifying their adequacy. If the Owner is performing observations during construction, the design documentation should include the proposals for confirming adequacy of these observations.
Design team	Persons or entities who design the building, building systems and related items. The team may include, but is not limited to: Fire designer, Architect/Architectural designer, Building Services designers, Civil designer, Evacuation consultant, Façade designer, Passive systems designer, Structural designer, Owner, Project manager.
Electrical Systems designer	Person or entity who designs the electrical systems. This may include, but is not limited to emergency lighting systems, electrical exit signage, PVs, batteries, EV charging devices, coordination of fire/smoke penetration requirements, etc.
Evacuation consultant	Person or entity who creates and institutes the management process to ensure people can evacuate safely from a building in the event of fire; includes location of assembly point, how alarm system functions for evacuation, roles and responsibilities of building wardens. Helps to develop, implement, and maintain a Fire Evacuation Scheme.
Engineering New Zealand	New Zealand's professional body for engineers, which changed its name from the Institution of Professional Engineers New Zealand Inc. (IPENZ) in 2017.
Façade designer	Person or entity who designs the exterior walls, roofs and/or windows for the building.
FENZ	Representative of Fire and Emergency New Zealand with delegated authority to approve the location of facilities for firefighting. This will typically be a district staff member with an operational background and sufficient experience to make decisions on behalf of the organisation on the location of those building elements.
Fire designer	Person responsible for the design of the fire safety components of the building work proposals, regardless of whether an acceptable solution, verification method or a performance-based fire engineering design is used. The Fire designer may specifically authorise another person to carry out duties associated with the fire design on their behalf, for example performing certain observations on site.
Fire System designer	Person or entity who designs the 'active' fire protection systems. This may include, but is not limited to fire sprinkler systems, fire alarm systems, fire hydrant systems, fire extinguishing systems, fire/smoke penetrations in relation to those services.
Hydraulic Systems designer	Person or entity who designs the hydraulic systems. This may include, but is not limited to firefighting water supplies, fire hydrant systems, fire/smoke penetrations in relation to hydraulic services.
HVAC consultant	Person or entity who specialises in the design, assessment, and implementation of Heating, Ventilation, and Air Conditioning systems.
IQP	Independently qualified person. A person accepted by a local BCA or council as qualified to inspect, test, maintain and report on specified systems.
Lead consultant	Person or entity appointed by the Building Owner to direct the works of the various consultants on the project. They are often an Owner's Representative and may, or may not, be part of the project's design team.
Lead designer	Person or entity engaged by the Building Owner with a specific level of authority to control the direction and development of a building's design. They are provided with a leadership role amongst the Design team and generally possess an overarching view of the building design and the integration of its many parts.
Main contractor	Building contractor with the responsibility of co-ordinating the other contractors on the site and resolving conflicting details and developing the programme for the construction on the building in accordance with the consented documentation.
Mechanical Systems designer	Person or entity who designs the mechanical systems. In relation to this document this may include, but is not limited to smoke control systems, air handling systems, and coordinates with fire/smoke penetration requirements.

(Building) Owner	The Building Owner as defined by the Building Act is the person responsible for obtaining all the necessary documents and approvals, and ensuring that the building work carried out complies with the building consent and the Building Code. The term 'Owner' can also include their delegated representative, agent, or the person who has control of the premises (such as landlord, tenant, property/building manager). www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306054
Owner's Representative	Person or entity appointed by the Owner of a building project to act on their behalf in managing and overseeing various aspects of a construction project.
Passive System designer	Person or entity who designs built-in fire protection elements for buildings. In relation to this document this may include, but is not limited to penetrations through fire separations, ire-resistant materials, and fire separations.
Performance-based fire engineering design	An approach to fire safety that focuses on achieving specific fire safety objectives and performance criteria, rather than adhering to prescriptive codes and standards.
Plans and specifications	The detailed documents and drawings that describe the design, construction, and materials to be used for a building project. These documents are typically required as part of the process for obtaining building consents and ensuring that the construction complies with building codes and regulations. These are defined in the Building Act 2004 S7. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306054
Project Manager	Person or entity appointed by the client to manage and coordinate the project on the Owner's behalf. Typically responsible for managing the project's budget, schedule, and quality and coordinating between various stakeholders, including the Owner, designers, contractors, and other consultants.
Security Systems designer	Person or entity who designs the security systems. In relation to this document this may include, but is not limited to escape route access, FENZ access, fire/smoke penetrations in relation to security services.
Spot Check	A form of sampling inspection to verify quality, compliance with specifications or adherence to standards. The frequency and extent of spot checks can depend on the project size, complexity and risk level.
Structural designer	Person or entity who is responsible for the overall design of the building structure. In relation to this document this may include, but is not limited to making structural calculations to ensure that structural elements requiring a fire resistance rating have the required load capacity.
Subcontractor	Person or entity that signs a contract to perform part or all of the obligations of another's contract. Subcontractors are hired by the main contractor to perform specific tasks as part of the overall project.
Test certifier	Person or entity who is an approved independent inspector who can issue test certificates to confirm compliance.
Verification method	Prescribed methods to demonstrate compliance with the Building code. Verification Method C/VM2 is the Framework for Fire Safety Design for New Zealand Building Code clauses C1–C6 Protection from fire, S22. www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306347

APPENDIX B
FIRE DESIGN DOCUMENTATION TABLE

The Fire Design Documentation Table outlines the content and form of fire design documentation, using items A to K from Table 1. The table is divided into columns as follows:

1. Column 1: Identifies the fire design element and describes and justifies the fire design demonstrating Building Code compliance. Plans and specifications should accurately describe and detail, as appropriate, all the fire protection measures required by the fire design.
2. Columns 2,3 and 4: Documentation is categorised into three format types,
   2. Narrative: Descriptive text that may include tabular information.
   3. Drawings and sketches: Figures, graphs, or mark-ups with unique identifiers.
   4. Verification and calculations: Numerical or qualitative data, including assumptions, limitations, input values, acceptance criteria, output values, and conclusions.
3. Column 5: Identifies design discipline/s typically responsible for producing identified document for the fire design element, as well as other disciplines that might provide additional input or collaboration, in some cases this will be the entire Design team.

NOTE: Fire Design documentation table

The level of detail required in the Table will vary based on the project's complexity and the design approach used, and not all items in the table will be relevant to every project, and therefore be required.

For example fire designs using:

Verification Method C/VM2 or performance-based fire engineering design will need design documentation to include the design justification (ie the basis for the design along with specific assumptions, limitations and exclusions) and if applicable may need modelling files.

Acceptable solutions, C/AS1 or C/AS2 may only need a narrative explaining how the acceptable solution has been used. For a stand-alone residential dwelling with limited specific fire engineering input to the design, separate documentation such as a specific fire report to set out the design basis may not be required. In this case a few paragraphs or even a simple drawing showing the escape routes and travel distances together with the boundary separation distances may be all that is necessary. These requirements and the approach may be shown on architectural drawings and contained in specifications, especially where compliance requirements are obvious and can be verified independently by the BCA relatively easily.

It is likely that separate sketches or drawings will not be needed for every item in the table, one set of sketches is likely to cover several items.

For each project the discipline responsible for each item in Table B1 might vary depending on the complexity of the project and the expertise and experience of those on the Design team. Where there is a variation in the discipline responsible is indicated by a '/' between the listed disciplines.

Table B1 Fire Design Documentation: Legend

✓ = Documentation to be provided by the identified discipline for all projects.

(✓) = Additional information to be provided where the design is not clearly detailed in the format indicated by the ticked boxes.

Table B1: Fire Design Documentation Table

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
A. Building description and building use				
Building size, geometry, location and use				
Provide a brief description of the building size, shape, location, geometry and intended uses to highlight any special features that affect the fire safety design. Include a site plan identifying key elements of the fire design. Describe any staging of construction or completion or occupation, or proposals for future stages which impact on the fire safety design.	✓	✓	(✓)	Fire designer
Advise fire protection requirements that will impact building or fire engineering design. For example: • Building limitations (height and construction details) based on sprinkler design options for the occupancy, water supply implications and clearance requirements. • Facilities for FENZ operations eg for hydrant outlets, protection from falling glass at FENZ attendance point, space required for valve/pump room and any ventilation considerations. • Dimensions of concealed spaces where sprinklers may be omitted.	✓	✓		Fire System designer
Provide plans of building location, size, shape for other consultant mark ups for incorporation into the Architect/ Architectural designer's plans.		✓		Architect/Architectural designer
Occupant load assessment				
Show how the design occupancy has been derived.	✓	✓	✓	Fire designer
Occupancy type and occupant characteristics				
Provide a brief description of the building occupancy to highlight any special aspects that affect the fire safety design.	✓	(✓)	✓	Fire designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Advise if the occupancy has specific requirements that impact the building or fire engineering design. For example: • Fire cell where sprinklers are to be omitted because the occupancy/room use, eg transformers. • Where there might be differences in system operation time due to the system required, eg pre-action systems in freezers.		✓		Fire System designer
Show on plans the room use and locations etc.		✓		Architect/Architectural designer
Fire hazards (as needed) and fire load				
Provide a brief description of the relevant fire hazards. Identify any assumptions such as any special hazards that affect the fire safety design (eg impact on design fires).	✓	✓	(✓)	Fire designer
List any specific aspects of the fire safety design or fire safety related specified systems that need particular inspection or commissioning during the construction monitoring phase. These items should also be listed for inclusion in the building Operation and Maintenance documents. Refer ACE NZ and Engineering New Zealand 'Guideline on the Briefing and Engagement for Consulting Engineering Services '.	✓	(✓)		Fire designer/Fire System designer
Determine or assess any features of the fire system design that impact the building design or fire performance requirements (eg ceiling height).		✓		Fire System designer
Design fires and Supporting information				
Provide information for design fire scenarios and supporting information for design fire characteristics.	✓	(✓)	✓	Fire designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
B. Design philosophy				
Design intent and methodology; compliance basis.				
State the scope of the fire engineering design – eg is it only for Building Code compliance or does the Owner have additional objectives such as property protection or business continuity or insurance considerations that have been included? List all the documents prepared by the Fire designer that form part of the overall fire safety documentation package (eg sketches, drawings, specifications, analyses, separate reports, Fire Engineering Brief documentation). Describe whether the design follows acceptable solutions, verification method or alternative solution. Provide a description of the means of overall escape methodology (eg all-out evacuation, sequential or staged).	✓			Fire designer
Legal environment for regulatory compliance				
List the sections of the Building Act, Building Code or other legislation covered by this design eg Hazardous Substances and New Organisms, Fire Safety and Evacuation of Buildings Regulations. State whether the design is required to be sent to FENZ.	✓			Fire designer
Record of outcome				
Where applicable, include the record of outcome of discussions with key stakeholders (eg BCA or FENZ), this may include sketches, scaled drawings), diagrams and correspondence with FENZ. If relevant include the Building Score (based on MBIE guidelines). and extent of documentation. Appendix 1: Building score sheet | Building Performance	✓	(✓)		Fire designer/Fire System designer
C. Means of escape				
Escape methodology				
Provide a description of the means of overall escape methodology (eg all-out evacuation, sequential or staged) with any assumptions and limitations, and acceptance criteria for quantitative methods.	✓			Fire designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Number and location of escape routes				
Indicate on drawings or sketches the positions and direction of internal escape routes to places of safety and final exits. Identify extent of protected escape routes eg protected paths and/or safe paths. Show the locations of safe places and final exits including any external escape routes. Include door swing and hardware performance requirements.	(✓)	✓	✓	Fire designer
Incorporate means of escape requirements into architectural plans.		✓		Architect/Architectural designer
Escape route width, capacity, travel distance or time				
Identify the location and width of escape routes. Provide calculations of the escape route flow capacities, travel distances and/or travel times to justify the location and width of escape routes.	(✓)	✓	✓	Fire designer
Incorporate all the escape routes design specification, ie height and widths of escape routes, including stairs doors, and locking devices into architectural plans and specifications.	✓	✓		Architect/Architectural designer with input from Electrical designer and Security systems designer as appropriate
Extent of fire protection of escape routes				
Identify the means of protecting the escape routes for example by fire rated construction or by separation distance. Include any management restrictions on escape route activities, eg storage height, fire load, permitted activities in safe paths, access and security.	✓	✓		Fire designer
Incorporate the lining materials required etc. to protect the escape routes into architectural plans.	✓	✓		Architect/Architectural designer
Visibility in escape routes/exit signage				
Describe the requirements for visibility and way finding. Show on sketches/drawings the escape route and coverage areas for emergency lighting. This could also include reference to another consultant's documentation. Identify doors that are exit doors and require exit signage.	✓	✓		Fire designer
Identify and incorporate into plans the location of all exit signs along the escape route. Incorporate type of signage required in specification.	✓	✓		Architect/Architectural designer
Provide the emergency lighting design as required, including electrical exit signage.	✓	✓		Electrical Systems designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
D. Fire safety systems				
Active fire protection systems (fire alarm, emergency warning and intercommunication system, detection and suppression systems)				
Identify systems required and the relevant performance requirements and installation standards (including the year), specifically noting any departures from full compliance with the relevant standard. Extent of systems to be clearly identified and communicated.	✓	(✓)	(✓)	Fire designer
Describe the evacuation alerting protocols.	✓	(✓)		Fire designer and/or Evacuation consultant
Describe interfacing requirements with other systems, including cause and effect information where relevant to develop the Design Fire Matrix. Refer to FPANZ code of practice for Integration of Building Fire Safety Systems with other Services. FPANZ-Building-Interface-Code-of-Practice-V1.0.pdf (fmanz.org)	✓	(✓)		Fire designer in conjunction with Design team
Identify on sketches the location of primary fire safety equipment such as the fire alarm display, fire sprinkler inlets, building hydrant inlets, fire control rooms, sprinkler valve room, etc.		✓		Fire designer/Fire System designer
Coordinate input data such as: sprinkler RTI/ temperatures/installation parameters, smoke detection obscuration, etc.	ü	(✓)	ü	Fire designer/Fire System designer
Provide spatial requirements for the Architect/ Architectural designer to incorporate in the building such as fire alarm display/control units, fire sprinkler inlets, building hydrant inlets, sprinkler valve rooms, hydrant outlets, sprinkler floor isolate assemblies, etc.		✓		Fire System designer
Provide spatial requirements needed to accommodate fire safety systems. Incorporate into plans bulk locations of fire suppression installations, locations of fire alarm zone index (mimic) panels, brigade access to system, risers and panels.		✓		Architect/Architectural designer in liaison with Fire systems designer
Smoke control systems – both active and passive				
Ensure overall requirements and initiating devices/systems are clearly identified and included in the Fire Matrix. Coordinate installation and commissioning standards, noting any deviations from the relevant standard.	✓	(✓)	✓	Fire designer and Mechanical Systems designer
Identify on sketches the extract and inlet points, extract rates and make-up air considerations.	(✓)	✓	✓	Fire designer and Mechanical Systems designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Incorporate smoke control requirements into the mechanical and other design documentation. Show on plans the location of smoke control equipment and features.	✓	✓		Mechanical Systems designer in conjunction with Design team
Incorporate into plans the location of smoke control equipment and features.		✓		Architect/Architectural designer in conjunction with Design team
Fire hose reels, extinguishers, first aid fire fighting				
Identify any requirement for hand operated fire-fighting equipment (eg client, 'Evac' regulations, insurer, sprinkler standard, HSE legislation, HSNO legislation). Identify installation standards, specifically noting any departures from full compliance.	✓	(✓)	(✓)	Fire designer/Fire systems designer/ Evacuation consultant
Incorporate into plans the locations of hand operated fire-fighting equipment along with signage as necessary.		✓		Architect/Architectural designer/Fire systems designer/Hydraulic Systems designer
E. Internal spread of fire and smoke				
Fire resistance ratings, compartmentation/separation				
Identify the locations and requirements/ performance (eg 30/30/30) for fire and smoke rated construction. Show these on plans, sections and elevations. Note for the location of structural fire rated elements, input from the structural engineer is normally required. Specify and coordinate with other disciplines as described in the two rows below.	✓	✓	✓	Fire designer
Provide typical construction details showing the system used or type and thickness of materials as applicable, which meet or exceed the required fire resistance ratings for compartmentation and for structural fire resistance. Include specification of proprietary systems as applicable. Incorporate these into plans in particular the elevations, sections etc. Include details showing particular materials/items etc, into the structure. Identify where fire rated walls are required to extend out to soffits within ceiling spaces. Provide details on drawings for fire rated seismic and control joints. Provide fire rated door installation details on drawings that reflect the door design. As applicable, coordinate specific details with Fire designer, Passive systems designer and Structural designer.		✓		Architect/Architectural designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Provide a section in the Design Features Report covering structural fire resistance to show how the requirements of Clause B1 of the NZBC are met. Provide documentation to identify the required extent of fire protection of structural elements to meet the structural fire resistance ratings (for example, the limiting temperature of structural steelwork, the minimum thickness and cover for reinforced concrete). As applicable, coordinate with the Architect/ Architectural designer and Fire designer to ensure that appropriate protective layers and detail of fire-rated structural elements and connections are included in the plans and specification. Specify that intumescent coatings be designed, applied, and monitored in accordance with the FPA Code of Practice for the Specification of Intumescent Coatings.	✓	✓	✓	Structural designer
Where required, provide the additional fire rating requirements that need to be incorporated into the design documentation. Examples include fire separation between sprinkler and non-sprinkler spaces, protection of external hydrants, hazardous substances and utility operator requirements.	✓	✓	✓	Relevant system designer in conjunction with Design team
Smoke compartmentation/separations				
Identify the locations of smoke separations. Show these on plans and cross-sections. Identify the size and locations of smoke baffles.	✓	✓		Fire designer
Incorporate into plans the locations of compartments/separations including sizes.	✓			Architect/Architectural designer
Penetrations (building services)				
Provide details of HVAC-specific penetrations eg fire rated dampers.		✓		Mechanical services designer/HVAC Consultant
Provide details of services that will penetrate fire and/or smoke separations. Identify any special build requirements for Fire Rated Dampers including hatches for maintenance, support structure and spacings.		✓		Building Services designer
Provide passive fire systems specification that provides solutions to meet the required fire and smoke ratings for the known services and construction types.	✓			Passive systems designer
Incorporate or reference the above into plans detailing specific items, locations etc.	✓	✓		Architect/Architectural designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Internal surface finish requirements				
Identify the location of air handling plenums in sleeping uses.		✓		Mechanical services designer
Provide performance requirements for internal surface finishes.	✓	(✓)		Fire designer
Provide performance requirements for surface finishes for HVAC ducts and pipes.	✓	(✓)		Fire designer
Incorporate into plans and specifications the type of material, finish coatings and treatments to surfaces.	✓	✓		Architect/Architectural designer
Doors, access panels and other closures in smoke and fire separations				
Identify performance requirements eg –/30/30 Sm and installation standards, specifically noting any departures from full compliance with the relevant standard.	✓	✓		Fire designer
Describe interfacing requirements with other systems (eg detection systems, security systems) to develop the Design Fire Matrix. Refer to FPANZ code of practice for Integration of Building Fire Safety Systems with other Services.	✓	(✓)		Fire designer in conjunction with Design team
Provide fire/smoke rated closure installation details on drawings that reflect the performance requirements of the fire design, including fire smoke rated closure schedule. Include any relevant compliance and installation information such as test reports/ third party certification and manufacturers requirements that may impact on design requirements.	✓	✓		Architect/Architectural designer and Building Services designer (as applicable)
Fire load limitations				
Show on drawings the locations where the type or quantity of fire load (eg storage height) is restricted. Describe the associated control and management procedures.	✓	✓	✓	Fire designer and Fire systems designer
Incorporate into the plans any bulk loads and any exclusion or restricted areas.		✓		Architect/Architectural designer
F. External spread of fire				
Fire separations: fire resistance rating and location				
Where required, provide fire rating or distance separation requirements that need to be incorporated into the design documentation. Examples include fire separation between sprinklered building and exposure hazards, safety of fire fighters using external hydrant outlets, hazardous substances and utility operator requirements.	✓	✓		Fire designer in conjunction with the Fire systems designer, Test Certifier (Hazardous Substances) and other as applicable

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Identify external wall construction and projections requiring a fire resistance rating (eg 30/30/30) and required proportion or areas – show these on sketches. Identify performance requirements of the external cladding or wall systems due to height or otherwise.	(✓)	✓	✓	Fire designer
Indicate how performance requirements are achieved including supporting evidence such as test reports or full-scale testing. Include any justification for variations of tested systems.	✓	✓	✓	Façade designer/ Architect/Architectural designer
Verify that post-fire stability requirements of NZBC Clause B1 have been incorporated into the structural design. Provide documentation to identify the required protection of external structural elements to meet the structural fire resistance ratings, (for example, the limiting temperature of structural steelwork, the minimum thickness and cover for reinforced concrete, and protective layers for structural timber).	✓	✓	✓	Structural designer
Incorporate into plans construction details showing the type, location and thickness of materials which meet or exceed the required fire resistance ratings for external walls. Show typical floor and wall junction details with cavity barrier as required.		✓		Architect/Architectural designer
Drawings showing relevant and notional boundaries				
Provide input to site plan showing relevant and notional boundaries, location of building and distances to all relevant and notional boundaries.		✓	✓	Fire designer
Incorporate into site plan relevant and notional boundaries.		✓		Architect/Architectural designer
Control of external vertical fire spread (elevations)				
Where applicable show on drawings the size, location and fire resistance rating of spandrels, or aprons. Identify location of cavity barrier protection requirements.	(✓)	✓	(✓)	Fire designer
Incorporate/reference into plans specific resistance ratings to claddings elevations.		✓		Architect/Architectural designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Provide passive fire systems specification that provides solutions to meet the required for fire and smoke ratings for the known services and construction types. Identify any special construction monitoring requirements. Prescribe the extent of installation certification required. Identify any ongoing inspection requirements.	✓			Passive systems designer
Include external/exterior sprinklers where required by Fire designer which may be additional to those required by sprinkler standards.	✓	✓		Fire System designer
External cladding systems				
Provide fire performance requirements f or cladding systems.	✓	(✓)		Fire designer
Incorporate/reference into plans specific cladding system requirements. Provide information reflecting the performance requirements of the fire design. Note: this requires input from others.	✓	✓		Architect/Architectural designer/Fire designer/ Passive systems designer/Façade designer
Review junctions from fire rated floors and walls to facades or other interfaces and ensure products and systems substantially match the test reports.		(✓)		Façade designer/ Architect/Architectural designer/Passive system designer in conjunction with Fire designer
G. FENZ access and firefighting facilities				
Appliance site access and attendance point/hard stands (This may not be necessary for minor alterations to existing buildings).				
Identify on sketches/site plan the FENZ vehicle access point, attendance point, fire alarm zone index (mimic) panel locations and any additional hard stands. Identify location of Fire Sprinkler Inlet and Fire Hydrant Inlet locations (within 20m of attendance point). Coordinate with FENZ as required.	✓	✓		Fire designer/Fire systems designer
Provide vehicle access with appropriate width and weight capacity and incorporate into plans.		✓		Architect/Architectural designer/Fire designer/ Civil designer
Incorporate into documents the brigade access and any specific security requirements.	✓	(✓)		Architect/Architectural designer/Security systems designer
Coordinate implications of proposed location for FENZ attendance point (including canopy etc.).	✓	✓	✓	Fire System designer/ Architect/Architectural designer

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Water supply				
If required, include water supply availability and requirements to the site for firefighting. Coordinate with FENZ as required.	(✓)	(✓)	(✓)	Fire designer/Fire System designer FENZ
Establish water supply availability and needs for fire protection systems.	✓		✓	Fire System designer
Incorporate into plans water distribution and provisions to access water within and around the site.	(✓)	✓		Architect/Architectural designer/Civil designer
Facilities in and around the building for FENZ use				
Identify key elements, locations of fire control rooms, emergency warning information systems, panels, sprinkler valve rooms, entry points, final exits, etc.	(✓)	✓		Fire designer with input from Fire System designer
Provide the completed Fire Fighting Facilities Checklist where appropriate (note: not a mandatory requirement).	✓			Fire designer input from Fire System designer
Provide clear access to facilities for FENZ use and show locations on plans.	✓	✓		Architect/Architectural designer
Incorporate the above into fire protection documentation.		✓		Fire System designer
Provide approval of fire safety features including Brigade inlets, fire alarm display units, fire control rooms.	✓	✓		FENZ
Hydrant outlets				
Describe or show locations of in-ground hydrants and hydrant system outlets as applicable on plans. Allow for access and clearance requirements.		(✓)	(✓)	Fire designer/ Architect/Architectural designer/Fire System designer/Civil designer as applicable
Show hose run coverage from in-ground hydrants/appliances and hydrant system outlets as applicable.		(✓)	(✓)	Fire designer/Fire System designer
Incorporate the above into fire protection documentation.		✓		Fire System designer
Provide approval of non-standard hydrant designs if appropriate.	✓	✓		FENZ
H. Construction Stage				
Fire Safety during construction				
Provide a Fire Safety Management Plan for the building contractor to implement for the entire construction process.	✓			Main Contractor in conjunction with Design team

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
If required apply for Certificate of Public Use if applicable under S363 of the Building Act. Amend Evacuation scheme if applicable. Building Act 2004 No 72 (as of 23 December 2023), Public Act – New Zealand Legislation	✓			Building Owner with input from Fire designer/Evacuation consultant as applicable
Advise of any need for independent witnessing of interface testing (as required by NZS 4512:2021) and agree who will undertake this. NZS 4512:2021	✓			Fire System designer
Ensure appropriate structural elements are constructed in accordance with the drawings and specification.				Structural designer
Construction stage change management				
Capture design changes that occur during construction phase and update consent documentation as required for minor variations and building consent amendments. Minor variations | Building Performance	(✓)	(✓)	(✓)	Project Manager and Design team as applicable
Commissioning				
Commission systems and test following the Construction Fire Matrix and finalise the As-Built Matrix. Includes commissioning of systems such as hydrants as applicable.	✓	✓		Construction Team in conjunction with Design team as applicable
I. Compliance Schedule For all fire safety related specified systems Note: only specified systems related to fire safety have been included in this table. For a list of all specified systems refer to Lead designer's coordinated list of specified systems for the project.				
Design				
Identify fire safety related specified systems that need to be listed on the Compliance Schedule with proposed inspection/ maintenance/management/operational requirements for each system. Include the year of any standard referenced. Identify the location/extent of coverage in the building for each specified system. Include Fire matrix if applicable.	✓	(✓)		Fire designer/Fire System designer with input from Design team as applicable
Provide input for Compliance Schedule and identify if specific product details are required for the Construction Team.	✓			Design team
Construction and commissioning				
Provide Quality Assurance documents for specified system in the Compliance Schedule.	✓	(✓)		Relevant installation companies

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Confirm that the specified systems are installed and tested as per the design. Provide the As built documents (where applicable).				Main contractor in conjunction with subcontractors
Update Compliance Schedule to incorporate changes arising from consent amendments. Refer to MBIE Exemplar document as a guide for producing Compliance Schedule. Exemplar compliance schedule | Building Performance	✓	(✓)		Main contractor in conjunction with the Design team
J. Post Construction Information				
Information for the BCA for Building Code compliance				
Documents for consent conditions may include any of the following: • list for construction documents which are required for each specified system. • construction quality assurance documents (eg PS3, PS4, test report from contractor/ installer/ consultant are obtained and supplied to the BCA, Building Owner/ property manager. • manufacturer's information, installation instructions, maintenance manuals and all other relevant information is obtained and supplied to the BCA, Building Owner/ property manager. • construction monitoring documentation. • required documents from qualified IQP/ accredited inspection body/system certifier are obtained and supplied to the BCA (eg Certificate of Compliance, Certificate of Completion, test reports, inspection letter).	✓			Project Manager/ Lead consultant/all consultants
Provide post construction documentation including As built drawings.	✓	✓		Project Manager/ Lead consultant
Provide any additional information required by the BCA relating to fire protection systems.	✓			Fire System designer
Application for Code Compliance Certificate.	✓			Owner/Main Contractor
K. Information for Building Owner/property manager				
Compliance Schedule including list of key equipment noting any ongoing requirements that are the Owner's responsibility.	✓			Project Manager/Lead consultant

Fire Design Element	Narrative	Drawings and sketches	Verification and calculations	Typical discipline responsible for producing plans and specifications for building consent and construction
Compliance Schedule including list of key equipment noting any ongoing requirements that are the Owner's responsibility.	✓			Project Manager/ Lead consultant
Clear identification of fundamental design assumptions that rely on management procedures that have been used to establish compliance (eg minimum staffing numbers).	✓			Project Manager/ Lead consultant with input from Fire designer
Clear identification of constraints the fire design imposes on the building use and how these are expected to be managed over the life of the building.	✓			Project Manager/Lead consultant with input from Fire designer
Design intention for the evacuation of the building.	✓			Project Manager/ Lead consultant with input from Evacuation consultant

APPENDIX C
DESIGN FEATURES REPORT SECTION: STRUCTURAL FIRE RESISTANCE

The Structural Design Features Report should include a section on Structural Fire Resistance. This section will state the Fire designer's requirements for Fire Resistance Rating (FRR) of load-bearing elements in the building, and explain in principle how these FRRs are achieved. This section will also document how the requirements of Clause B1 of the NZBC have been met.

The following example would be suitable for a multi-story commercial, residential, industrial or health building.

Design Features Report Section: Structural Fire Resistance (Example)

Input FRR:

A summary of the Fire designer's requirements for fire resistance rating (FRR) of all load-bearing elements.

In most cases there will be one level of FRR for the whole building. If not, please explain.

- Roof structures typically don't have specific FRR requirements, However, the need for fire protection of roof structure should be evaluated for each project, as this will depend how the roof structure interacts with fire separation, as these interactions may require fire rating of the roof structure.
- Most isolated structural elements will require a structural FRR of 30/-/- or 60/-/-, whereas load-bearing floors and walls may require a full FRR of 30/30/30 or 60/60/60, for example.

Note: Fire protection requirements for structures are not solely determined by the structural designer's specifications or the Fire designer's structural calculations. Additional factors should be overlain, such as whether the structure supports fire rated walls, and the structure's location within fire related spaces.

Load calculations:

- For each structural element, the applied load has been calculated using the load combinations for fire in AS/NZS 1170.0.
- Lateral loads for fire design have been assessed in accordance with B1/VM1, 2.2.4.

Structural elements:

- The important load-bearing elements have been identified. This includes all floors and their supporting structure, load-bearing walls, floor diaphragms, and isolated structural elements such as beams, columns and diagonal braces.
- The required fire performance of each element is described, along with the design assumptions regarding fire exposure, and applied loads.
- The structural load capacity has been calculated to resist the applied loads, under the expected boundary conditions, using simple or advanced calculation methods.
- Where appropriate, deflection head allowances to affected fire separation walls have been described.

Structural materials:

Different approaches for different structural materials are described below.

Structural steel

- Required FRRs for structural steel elements have been identified on the structural drawings.
- Limiting steel temperatures for structural steel elements have been calculated for each structural element and documented in the structural documents along with performance requirements for the design of steelwork fire protection systems.
- Expansion allowances at structural steelwork connections, and ductility to cope with the expected deformations. have been addressed.
- Structural elements have been protected to the required FRR with a protective layer of intumescent

paint, sprayed-on product, or board material.
- Elements requiring no protection have been identified.
- For board materials, a schedule of the type and minimum thickness of protective boards has been given to the Architect/Architectural designer.
- Intumescent paint for structural fire resistance, has been specified to be designed, applied, and monitored in accordance with the FPANZ Code of Practice for the Specification and Application of Intumescent Coatings for the Fire Protection of Structural Steel.

Reinforced concrete

- For in-situ and precast reinforced concrete and prestressed concrete, the minimum cover to reinforcing steel is shown on the structural drawings.
- Calculations have been carried out where necessary in accordance with NZS 3101.
- For proprietary concrete systems, the required FRRs are documented in the structural drawings or specifications.

Light timber frame

- For proprietary systems, the FRR for fire separation and load-bearing capacity has been checked with the manufacturer's literature.
- The assemblies with board materials for fire protection of timber framing are documented by the Architect/ Architectural designer.

Structural timber

- For structural elements and connections in solid sawn timber, glulam or LVL, the fire resistance has been assessed using the charring calculations in AS/NZS 1720.4.
- The finished sizes and connection details are shown on the structural drawings.

Cross laminated timber (CLT)

- For CLT, the load-bearing capacity for the required FRR has been checked with the manufacturer's literature.
- The finished sizes and connection details are shown on the structural drawings.

APPENDIX D
EXAMPLE OF CONTENT HEADINGS FOR A FIRE REPORT

The list below is not exhaustive but shows the range available and includes the main areas that a Fire designer or entity may, or may not, include within their document.

This content does not apply to all projects and should be adapted to the complexity of the project, compliance pathway adopted, and other applicable considerations.

In addition, it is not intended to be used by regulatory bodies during the building consent or review process to establish the exact content of what should be included within a fire report document.

Content headings for a Fire Report

1. Executive summary of fire report requirements
2. Building Act compliance
3. Other relevant legislation
4. Design philosophy
5. Fire and Emergency New Zealand board review where applicable
6. Stakeholders
7. Building description and building use
8. Occupancy and risk groups
9. Evacuation strategy
10. Means of escape
11. External escape routes
12. Architectural features
13. Firecells and fire separations
14. Fire and smoke stopping
15. Internal surface finishes
16. External walls and cladding systems
17. Fire protection systems
18. Building services
19. Emergency lighting
20. Signage
21. Horizontal spread of fire
22. Firefighting facilities and fire service vehicular access
23. Fire matrix
24. Draft compliance schedule
25. Construction monitoring
26. Coordination
27. Calculations and analysis
28. Limitations and liability
29. References
30. Appendix A – Fire engineering drawings
31. Appendix B – Modelling input/output files
32. Appendix C – Fire engineering brief
33. Appendix D – Stakeholders correspondence

APPENDIX E
FURTHER INFORMATION ON DOCUMENTING FIRE DESIGNS

This Appendix provides further information on the expectations for fire design documentation.

The intended use of the building

The application needs to outline the full details of intended uses (current and proposed) within the building. When alterations are planned, this gives an indication of whether there might be a "change of use".

Plans and specifications

Details of the building work proposals are provided in the plans and specifications. They should be specific to the particular building work and provide sufficient detail for the building work construction and maintenance. For building consent, design documents should result in the building work complying with the Building Code if the building work were properly completed in accordance with those plans and specifications. Any references to other sources should be identified with an explanation on how will be used in relation to the building work.

The Fire designer's documentation focuses primarily on fire performance and is insufficient in itself to be used for construction. However, it often compliments other consultant's documents. For example, the fire design may require fire rated walls at certain locations, but the walls' specification and construction details will be covered in the architectural documents. Similarly, fire detection system requirements may be provided in the fire design, but the fire protection systems designer will prepare the specification.

The plans and specifications may include product details such as the specific product to be used, manufacturer and model number, and other unique identifying information. However when contractors and suppliers are not known at the time of consent application (eg for a project following common construction industry practice which arranges construction contracts in parallel with or subsequent to applications for building consent), it is more appropriate to specify required performance instead. This could include fire resistance rating for structural elements, fire dampers, or protective sleeves for fire penetrations.

The Fire designer cannot consider matters in isolation. The Fire designer's responsibilities include familiarity with the overall building work proposals and for co-ordinating the process through which fire designs are appropriately incorporated into the plans and specifications. Information provided by the Fire designer which is directly related to construction should include any procedures proposed for construction monitoring and include any details needed for the Compliance Schedule in regard to fire safety related specified systems.

For alterations or change of use an existing building, or part of an existing building, Building Act Sections 112 and 115 require Fire designers to assess means of escape from fire for the entire building. Plans and specifications should provide sufficient details for the BCA to be reasonably satisfied that the alterations will improve the building's fire compliance to the extent required by the relevant Section of the Building Act.

Justification, calculations and conclusions

The engineering basis for the design (methodology and analytical approach) should be outlined and justified, along with the reasoning behind the design criteria, the fire and occupant scenarios chosen and all associated assumptions and limitations. This may include:

- The occupancy and maximum number of occupants
- Maximum size of spaces
- Operating parameters for detection and suppression systems (for example, if specific smoke obscuration settings are used, then this has to be communicated to the alarm designer. If specific temperature, distance down, or RTI settings are used, this has to be agreed with the Fire System designer to coordinate compatibility with sprinkler standard)
- Limitations on fire load or material surface finishes
- Threshold values for the point at which the design no longer meets acceptance criteria.

The Fire Engineering Brief (FEB) should contain the fire design justification as part of the overall fire design documentation. If there is no FEB then this information should still be provided to support the design.

If computer models are used, specify:

- Full details of the programme (eg name, version number, date)
- Technical literature and its source (if the literature is not readily available, the literature needs to be included with the application subject to any copyright restrictions).
- Justification for choosing the model and sensitivity to key parameters
- Input value explanations and detailed outputs showing how and why conclusions were drawn.

The information supplied should be sufficient to enable another party to replicate the models and reproduce the calculations. Include extensive outputs in appendices or separate referenced documents.

Include all calculations (inputs, workings, outputs) demonstrating compliance with the Building Code's performance criteria. Clearly state conclusions from the design methodology and calculations.

If the design requires a waiver/modification of Building Code requirements, specify affected clauses, reasons, and any necessary legal conditions (eg no building zones on adjacent property) that may be required to support the intended outcome.

Documents verifying Building Code compliance

The Building Code is performance-based, focusing on how a building should perform in its intended use rather than prescribing design and construction methods. Building Owners can choose the way in which building designs are prepared and how they demonstrate code compliance.

Documentation should show how the fire design complies with the Building Code. Fire design pathways include:

1. Prescriptive 'deemed to satisfy' fire safety compliance documents approach using Acceptable Solutions C/AS1 (residential), C/AS2 (residential and commercial) documents.
2. Verification Method CVM2.
3. Alternative solution using a performance-based fire engineering design which may include specific elements of design to the compliance documents.

The Building Consent Application should provide sufficient information for the BCA to be satisfied that the design complies with the Building Code. This may include a fire report detailing how the proposed design meets acceptable solutions or verification method requirements.

Document content supplied to the BCA will depend on the building work's nature and complexity. A written report typically needs accompanying drawings, sketches, specifications and other supporting documentation described in this Practice Note.

For performance-based fire engineering designs it is important to agree on the proposed methodology with the BCA as part of the Fire Engineering Brief process.

Acceptable solutions

Acceptable solutions provide prescriptive options to comply with Clauses C1 to C6 of the Building Code, and are applicable to a wide range of buildings.

When using acceptable solutions, the information submitted needs to describe how the prescriptive solution has been used. There is no need to justify the provisions but the documentation requirements in the Fire Design Documentation Section still apply.

Design assumptions may need to be documented and will be useful to all stakeholders, regardless of the design approach. Any limitations on use of the building, now or in the future should be communicated.

Performance-based fire engineering design

Verification Method

C/VM2 provides a design process including methodologies for demonstrating compliance with several specified design scenarios. This requires complex calculations and is typically used by professional Fire engineers. BCA's may require peer reviews for C/VM2 and performance-based designs.

Verification documents for performance-based design will usually include design assumptions, justification, calculations, and conclusions. These often comprise written reports and numerical calculations, which may include computer modelling. Information should be coherent, prepared by an appropriately qualified person, (ie person with formal qualifications and demonstrated competence in fire engineering design) and reviewed by an appropriately competent engineer (ie a Chartered Professional Engineer).

Performance specifications describe product or system performance without necessarily specifying products. Fire designers typically provide performance specifications, for example, fire resistance ratings for items such as walls, floors or doors, identifying their location but without specifying the system to be used. Architects/ Architectural designers use these specifications to choose compliant systems that meet other project requirements. The use of generic performance specifications needs to be context specific, and include how and at what point verification of compliance will be achieved.

Performance specifications are important contractual documents, but care is needed when specifications require design work and product selection after building consent approval. Design work and product selection should be completed prior to the Building Consent Application, to ensure the BCA can review Building Code compliance evidence, which includes product and system approval.

The Building Regulations 2022[3] require building product manufacturers and importers to provide the required building product information and to make this information available online. This improves the ability of designers' and BCA's to review product compliance early in the process and have the evidence available at the time of building consent.

Alternative Solution

An alternative solution is any approach that deviates, even minimally, from acceptable solutions or verification method. The lack of formally published verification or justification for many parts of the compliance documents complicates the process of quantifying the impact of even minor deviations on the overall fire safety solution. While justifying the variation might be straightforward, changes affecting more than one fire safety subsystem's performance typically requires more comprehensive justification. Complex design work should be prepared by an appropriately qualified person, (ie person with formal qualifications and demonstrated competence in fire engineering design) and reviewed by an appropriately competent engineer (eg a Chartered Professional Engineer).

Refer to MBIE guidelines for Alternative Solutions[4].

Producer Statements

If the BCA (or an independent regulatory reviewer) relies on producer statements from the Fire designer, these must be included with the consent documentation. In cases where a Peer Review has been conducted, both a PS2 (Producer Statement – Design Review) and Peer Review log should be submitted as part of the documentation package. Engineering New Zealand Practice Note 1 gives guidance on the experience/qualifications required to sign Producer Statements.

3 Building (Building Product Information Requirements) Regulations 2022
4 Alternative solutions for Building Code clause C Protection from Fire | Building Performance

Qualifications for undertaking fire design

Currently, no formal qualifications are required for fire design or fire design document submission using any approach. However even the basic acceptable solutions approach requires an understanding of its application.

Those using acceptable solutions should have extended familiarity or practice under competent supervision.

Performance-based approaches should be limited to qualified, competent engineers proficient in engineering modelling, with formal qualifications and demonstrated competence in fire engineering design.

Other information reasonably required

The Building Act 2004 allows BCAs to request additional information for processing Building Consent Applications and issuing Code Compliance Certificates. This may include information not covered in Parts 1 to 5, necessary to:

- Detail and justify the fire design's compliance with the Building Act 2004 and Building Code
- Confirm the adequacy of construction upon completion of the building work.

This additional information may cover:

a. The Fire designer's and other relevant parties' knowledge and experience. This includes details on qualifications, competency, knowledge, and practice, as recommended in the IPENZ Fire Engineering Taskforce Report, which are particularly important for Performance-based fire engineering designs. Information on qualifications, areas of competency, knowledge and practice in regard to other involved parties, such as those conducting regulatory reviews or construction monitoring, should also be included.

b. Confirmation of the adequacy of any construction review when the building work has been completed. The building consent applicant should confirm that on-site construction monitoring, as outlined in the building consent, has been carried out, and the work was in accordance with the plans and specifications. This confirmation may involve producer statements or other documentation such as site reports as agreed with the BCA during the application stage.

APPENDIX F
OTHER BUILDING ACT CONSIDERATIONS

Alterations to, changing the use of, and sub dividing existing buildings

When a building undergoes alteration, subdivision, or change of use, it may require upgrades to meet current Building Code performance criteria. For building alterations, the applicant should demonstrate to the BCA that post alteration, the building will comply As Nearly As Is Reasonably Practicable (ANARP) with Building Code provisions relating to means of escape from fire (see Building Act 2004, Section 112'). Adequate justification for ANARP should include a comprehensive Cost-Benefit Analysis (CBA) that evaluates the trade-off between the potential risks and associated mitigation costs, quantified in monetary terms. This analysis should clearly demonstrate that the additional expenditure required to further reduce the risk is grossly disproportionate to the benefits achieved in terms of risk reduction. Before changing a building's use, the Owner should obtain written notice from the Territorial Authority that the building will comply ANARP with the provisions for fire escape, protection of other property and fire rating performance (see Building Act 2004, Sections 114 and 115).

If applying for a subdivision that affects a building or part of a building, an Owner should provide reasonable grounds to the Territorial Authority that the building will comply ANARP with provisions for fire escape routes and protection of other property (see Building Act, Section 116A). For more information on ANARP see the Ministry of Building, Innovation and Employment's guidance document on assessing ANARP for the outstanding fire and accessibility Building Code clauses[5].

Under Sections 112, 115 and 116A of the Building Act, any code clauses not specified above must not have their level of compliance made worse by the proposed work.

Design documentation submitted for a subdivision or building consent for alterations and/or a change of use needs to detail and justify how the building will meet the Building Act and Building Code requirements.

When proposing that the existing means of escape provisions complies with the Building Code ANARP or when recommending building upgrades for compliance, adequate justification should be provided by the Fire designer that compliance has been achieved and also how this has been achieved.

Variations to a building consent

When proposing changes to a building consent, the BCA should be provided with details and justifications so they can consider and approve the change. The approval process will vary depending on the nature of the proposed change, ranging from a simple verbal confirmation to a formal application for an amendment to the building consent. In all cases, the BCA's written approval is required before carrying out any work that deviates from the original approved building consent.

For more information, see the Ministry of Building, Innovation and Employment's guidance document on building consent amendments.[6]

Application to waive/modify compliance with a requirement of the Building Code

If building work cannot comply with a Building Code requirement, the Territorial Authority may waive or modify the requirement to comply if deemed reasonable under the circumstances. The Owner should provide evidence justifying why the work does not need to meet the requirement, including any mitigating factors that may be relevant. The fire design documentation should identify the request for waiver or modification and specify the Building Code affected clauses (eg NZBC C3.3, C3.6, C3.7).

5 Step 3: Applicants assess ANARP for outstanding fire and accessibility Building Code clauses | Building Performance
6 Amendments guidance | Building Performance

Considerations for a Building Code waiver or a modification request:

- A legitimate and appropriate reason must exist for the waiver or modification request.
- Issuing a waiver or modification shall not materially increase fire risks to occupants, emergency services, or neighbouring buildings in practical terms.
- If any conditions imposed as part of issuing the waiver or modification are breached, it should be possible and practical to upgrade the building to meet the waived or modified Building Code requirements.
- The fire design documentation should identify the relevant part of the building, and if applicable, relevant boundaries related to the waiver or modification request.
- The Territorial Authority has sole discretion in issuing a waiver or modifications; the applicant cannot force the Territorial Authority to issue a waiver or modification.

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