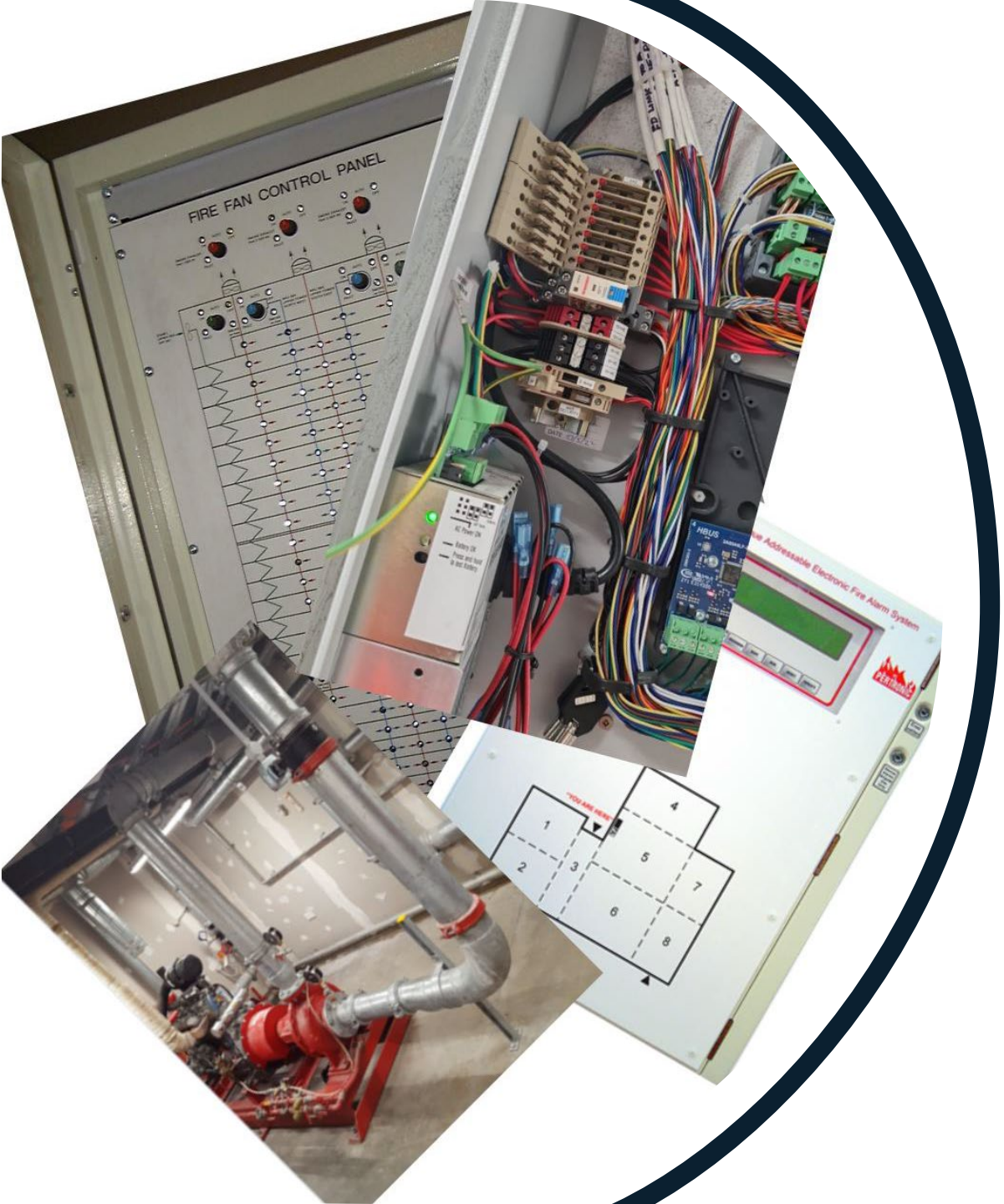


NDY
A TETRA TECH COMPANY

ABC ASSOCIATION OF BUILDING COMPLIANCE

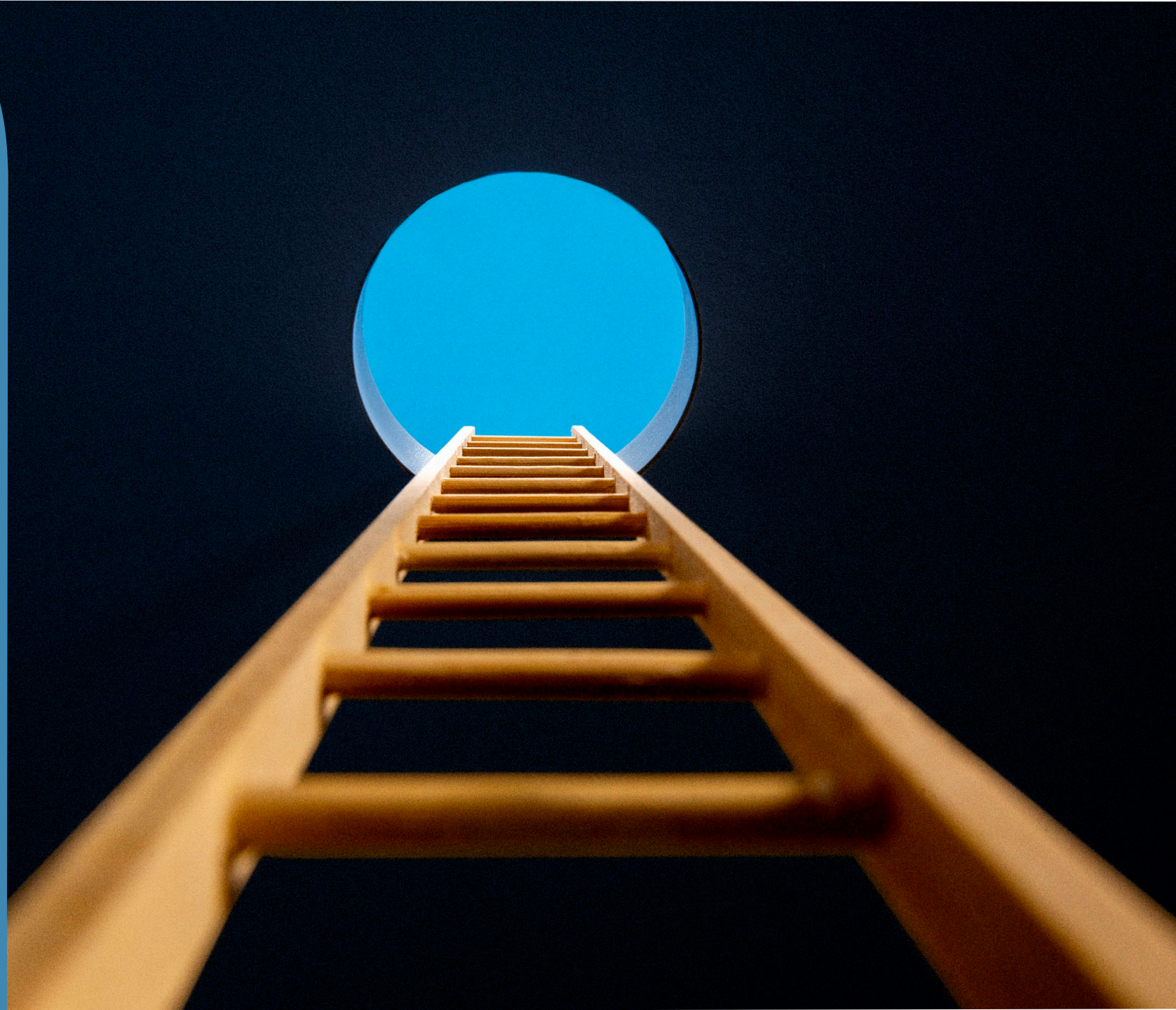
2023 Conference

POST CONSTRUCTION IQP INTERFACE TESTING

Post Construction IQP Interface Testing

Robert Peart
CPEng CMEngNZ PMSFPE

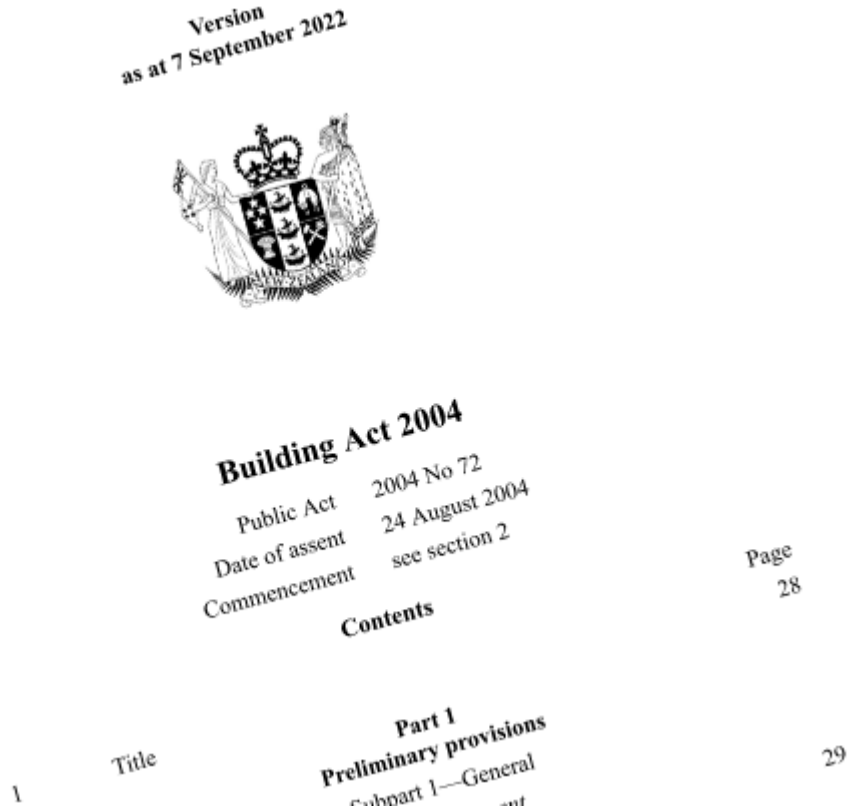
THE LAW
THE IDEAL
THE REAL



THE LAW – BUILDING ACT 2004

Know the Law

Make the law your friend.



Version
as at 7 September 2022

Building Act 2004

Public Act 2004 No 72
Date of assent 24 August 2004
Commencement see section 2

Contents

Page
28

Part 1
Preliminary provisions

Title 1

Subpart 1—General 29

THE LAW – BUILDING ACT 2004

Annual Building Warrant of Fitness

- Compliance Schedules – s 100 to s 107
- s 103 Contents of a compliance schedule
- s 108 Annual building warrant of fitness
- s 109 Territorial Authority must consider recommendation to amend compliance schedule
- s 110 Owner must obtain reports on compliance schedule

THE LAW – BUILDING ACT 2004

Compliance Schedules

s 103 Content of compliance schedule

(1)A compliance schedule must

(a) state and describe each of the specified systems covered by the compliance schedule, including a statement of the type and (if known) make of each specified system; and

THE LAW – BUILDING ACT 2004

Compliance Schedules

s 103 Content of compliance schedule

(1) A compliance schedule must

(a)…

(b) state the performance standards for the specified systems; and

THE LAW – BUILDING ACT 2004

Compliance Schedules

s 103 Content of compliance schedule

(1) A compliance schedule must

(a) …

(b) …

(c) describe the inspection, maintenance, and reporting procedures to be followed by independently qualified persons or other persons in respect of the specified systems to ensure that those systems are capable of, and are, performing to the performance standards

COMPLIANCE SCHEDULES

SS 2 Automatic or manual emergency warning systems for fire or other dangers			
Description (incl type)	Type 6 – automatic fire sprinkler system with automatic signaling to a remote receiving centre, plus a Type 2 manual fire alarm system		
Specified system photo/s	 Fire indicator panel; Manual call point (MCP); Alarm control unit		
Make (if known)	[*brand name & series number*]	**Installation date**	2020
Model (if known)	[*model number*]		
Location/s	Manual call points (10 total – 6 on grd, 2 on L1 & 2 on L2). Refer to Appendix B of this document for location of MCPs Fire indicator panel is located on NE wall facing the car parking area & behind reception		
Performance standard	NZS 4512:2010 Fire detection & alarm systems in buildings (original version) – (https://www.standards.govt.nz/shop/nzs-45122010/ refers)		
Inspection procedures	NZS 4512:2010 Fire detection & alarm systems in buildings (original version), refer to Part 6, Maintaining systems in compliance & good working order		
Inspection frequencies	Monthly	Annually	
Inspection personnel	IQP	IQP	
Maintenance procedures **System interfacing**	NZS 4512:2010 Fire detection & alarm systems in buildings (original version), refer to Part 6, Maintaining systems in compliance & good working order SS 1 Automatic systems for fire suppression SS 3/1 Automatic doors SS 8/1 Passenger-carrying lifts SS 9 Mechanical ventilation or air conditioning systems SS 12/2 FM radio frequency systems & infra-red beam transmission systems SS 13/1 Mechanical smoke control Functional testing (end to end) of the interface between the systems is to be carried out annually & certified by each IQP for those systems. All relevant IQPs must be on site at the time of testing		
Reporting procedures	The building owner must obtain annual written reports from any IQP or other person who carried out one or more inspections &/or maintenance procedures. Reports must, as a minimum: i. record any inspection, test, repair or maintenance carried out ii. record any faults found or maintenance required & the remedy applied iii. include the date the work was carried out		

- MBIE Exemplar Compliance Schedule
- Includes a section on System Interfacing
- Does not yet include enough information for interface testing

https://www.building.govt.nz/assets/Uploads/building-officials/guides/exemplar-compliance-schedule.pdf

THE LAW – BUILDING ACT 2004

Annual Building Warrant of Fitness

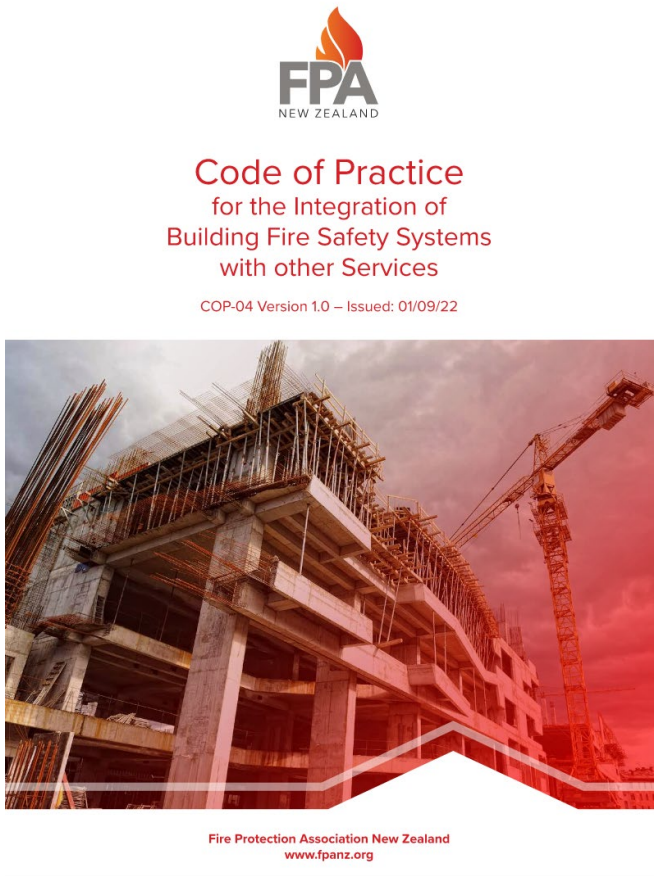
Where does interface testing fit into complying with the Law?

s 108 Annual Building warrant of fitness

(1) …

(2) The purpose of a building warrant of fitness is to ensure that the specified systems stated in the compliance schedule are performing, and will continue to perform, to the performance standards for those systems that are set out in the relevant building consent.

CODE OF PRACTICE

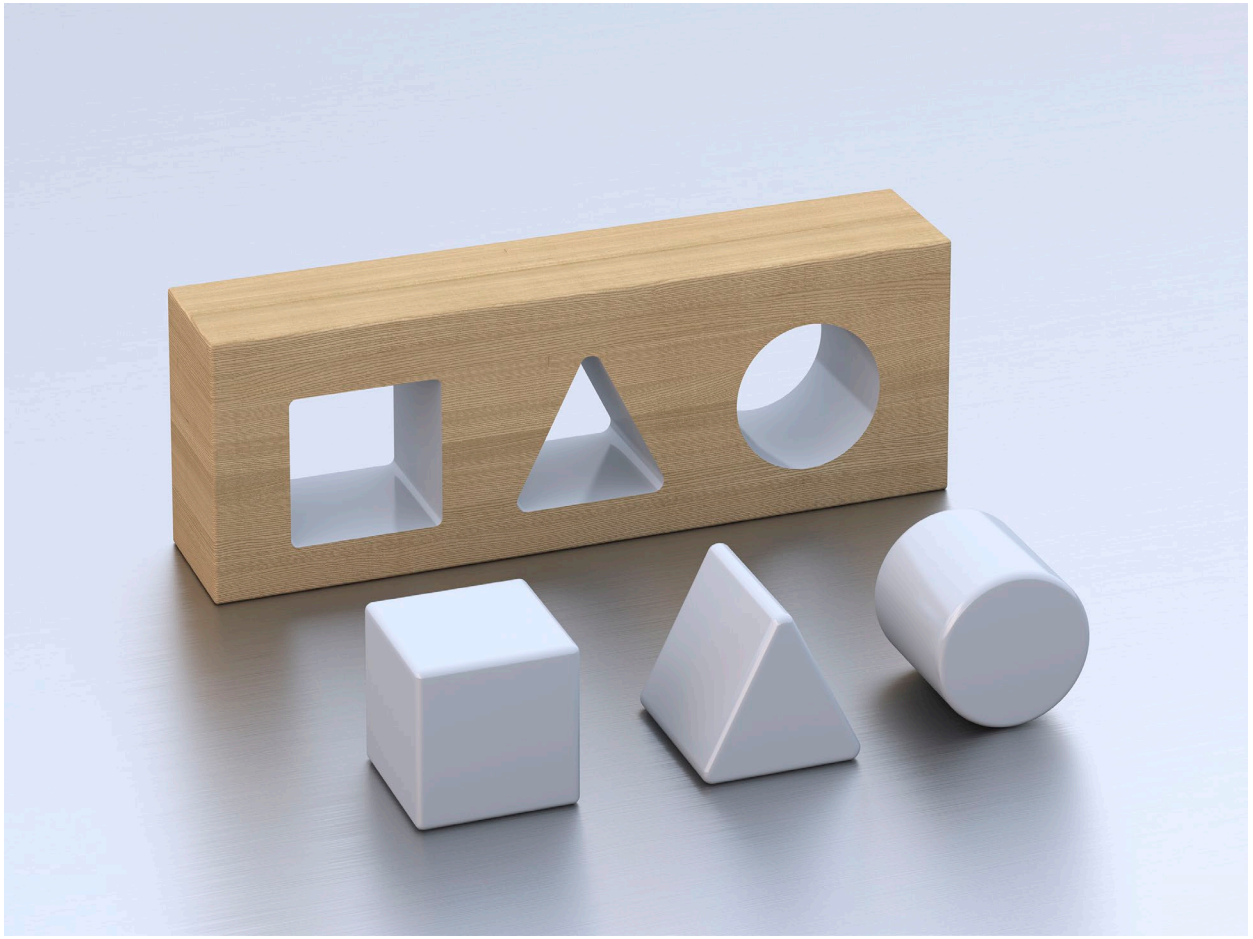


- Fire Protection Association of New Zealand
- Code of Practice for the integration of Building Fire Safety Systems with other Services

https://www.fpanz.org/docs/codes-of-practice

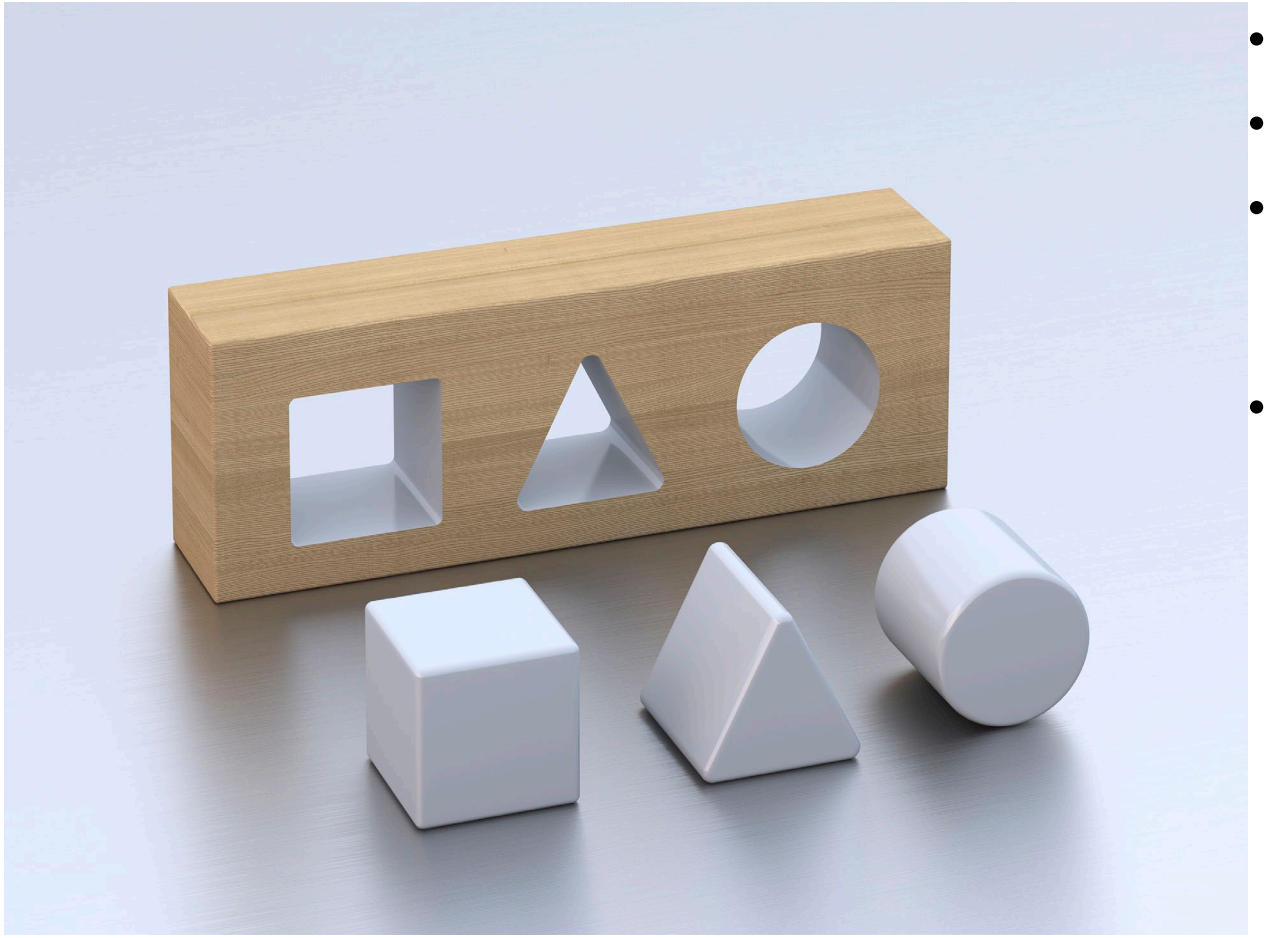
NDY
A TETRA TECH COMPANY

IDEAL WORLD VS REAL WORLD



IDEAL WORLD

Comprehensive Compliance Schedule with all necessary information



- Comprehensive Compliance Schedule
- Competent IQP's
- Knowledgeable building owner who wants testing and maintenance done properly
- Competent and knowledgeable professional to run the integrated testing

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Fire Alarm System - Most Common Specified System for Interfacing

- Multiple IQP's involved
- Attend site at the same time
- Wide and varied access requirements

NDY
A TETRA TECH COMPANY

EFFECTIVE INTERFACE TESTING

Fire Alarm System - Most Common Specified System for Interfacing

- All IQP's require a good knowledge of their respective interfaces to be tested
- All IQP's require a good knowledge of their expected outcomes

EFFECTIVE INTERFACE TESTING

Fire Alarm System - Most Common Specified System for Interfacing

- There needs to be a “integrated testing agent” who has a good overview of the systems to be tested (building owner, fire engineer, specialist commissioning/testing agent)

EFFECTIVE INTERFACE TESTING

Test Plan

- The “integrated testing agent” will have prepared a test plan with numbered actions to activate the fire alarm system and check the consequent actions.
- The test plan will need to be issued to all participants
- A comprehensive test report should result.

EFFECTIVE INTERFACE TESTING

Source of building specific knowledge – COMPLIANCE SCHEDULE

- Compliance schedule must list:
  - all the interfaces for each interfaced specified system
  - detailed commissioning fire control matrix
  - For other interfaced specified systems a detailed commissioning matrices specific to the system – particularly mechanical.

EFFECTIVE INTERFACE TESTING

Source of building specific knowledge – COMPLIANCE SCHEDULE

- Compliance schedule must also include the original commissioning test results

EFFECTIVE INTERFACE TESTING

Example Fire Control Matrix

CONSTRUCTION FIRE MATRIX

CAUSE	EFFECT													
		FENZ notification via monitor company 'ABC'	Fire contractor notification via monitor company 'ABC'	Building wide alarm	Local alert - fire cell of origin only	Building HVAC fan (SF-R01) / damper (FD-01) via 1 x relay	Car park supply air (SF-R02) via relay	Jet fans (JF-01, JF-02) via 2 x relay	Corridor Electrical lighting to 100% via local relay	Doors (MD-01) / gates (site entry) via relay	Lift 01 via 2 x relay[4]	Security company text via monitor company 'ABC'	Owner text via high level interface to BMS	Utilities - Gas solenoid G-01 via relay. Manual reset	Fire Door 103 hold open device via relay
	Sprinkler operation	Fire	Fire	Fire	-	off	on	off	on	release	recall	Fire	Fire	off	-
	Sprinkler supervised valve operation	Fire	valve op	Fire	-	off	on	off	on	-	recall	valve op	valve op	off	-
	Sprinkler defect/isolate	Defect	Defect	-	-	-	-	-	-	-	-	Defect	Defect	-	-
	Manual call point (MCP) operation	Fire	Fire	Fire	-	off	on	off	on	release	recall	Fire	Fire	off	-
	Smoke/Heat detector operation	Fire	Fire	Fire	-	off	on	off	on	release	recall	Fire	Fire	off	-
	Apartment smoke detector operation[1]	-	Alert X	-	Alert X					-	-	Alert X	Alert X		-
	Fire door smoke detectors (D119, D120)	Fire	Fire	Fire	-	off	on	off	on	release	recall	Fire	Fire	off	close
	Fire alarm defect/isolate	Defect	Defect	-	-	-	-	-	-	-	-	Defect	Defect	-	
	Supply Air duct detector operation (D101)[2]	-	-	-	-	-	off	-	-	-	-	alert	alert	-	-
	Fan control override switch 1 - Carpark supply on[3]	-	-	-	-	-	on	-	-	-	-	alert	alert	-	-
	Fan control override switch 1 - Carpark supply off[3]	-	-	-	-	-	off	-	-	-	-	alert	alert	-	-
	Fan control override switch 2 - Jet fans on[3]	-	-	-	-	-	-	on	-	-	-	alert	alert	-	-
	Fan control override switch 2 - Jet fans off[3]	-	-	-	-	-	-	off	-	-	-	alert	alert	-	-
	Power failure	-	-	-	-	-	-	-	-	release	-	alert	alert	off	close

NDY
A TETRA TECH COMPANY

EFFECTIVE INTERFACE TESTING

Example Complex Fire Control Matrix

CONSTRUCTION FIRE MATRIX

CAUSE	EFFECT: Fire Alarm									EFFECT: Mechanical						EFFECT: Electrical					EFFECT: Misc.			
	FENZ notification via monitor company 'ABC'	Fire contractor notification via monitor company 'ABC'	Alarm - Building wide	Alarm - Zone A	Alarm - Zone B	Alarm - Zone C	Escalation timer 3	Remote Display Unit	Fire alarm LED indicators Flow and level zone	Building HVAC fans (SF-R01/R02/R03) / damper (FD-01/02) via 1 x relay	HVAC -Zone A fan (SF- R01) via 1 relay	HVAC -Zone A -B damper (FD-01) via 1 relay	HVAC -Zone B fan (SF- R02) via 1 relay	HVAC -Zone B-C damper (FD-01/02) via 1 relay	HVAC -Zone C fan (SF- R03) via 1 relay	Corridor Electrical lighting to 100% via local relay	Doors (MD-01) / gates (site entry) via relay	Security monitoring company text via monitor company 'ABC'	Fire Door A-B hold open device via relay	Fire Door B-C hold open device via relay Utilities -	Gas solenoid G-01 for Zone C via relay. Manual reset	Fryer, oven zone C	Nurse call via high level interface	Ownertext via monitor company 'ABC'
Sprinkler operation[1]	Fire	Fire X	Fire	Fire	Fire	Fire	-	Fire	on	off	off	close	off	close	off	on	release	Fire	-	-	off	off	Fire X	Fire X
Sprinkler supervised valve operation	Fire	valve op	Fire	Fire	Fire	Fire	-	-	on	off	off	close	off	close	off	on		Fire	-	-	off	off	-	valve op
Sprinkler defect	Defect	Defect	-	-	-	-	-	-	on	-	-	-	-	-	-	-		Defect	-	-	-	-	-	Defect
Sprinkler isolate	Isolate	Isolate	-	-	-	-	-	-	on	-	-	-	-	-	-	-		Isolate	-	-	-	-	-	Isolate
Zone A MCP operation	Fire	Fire A	-	Fire	Alert	-	-	Fire AX	on	-	off	close	on	-	-	on	release	Fire	-	-	-	-	Fire AX	Fire A
Zone B MCP operation	Fire	Fire B	-	Alert	Fire	Alert	-	Fire BX	on	-	on	close	off	close	on	on	release	Fire	-	-	-	-	Fire BX	Fire B
Zone C MCP operation	Fire	Fire C	-	-	Alert	Fire	-	Fire CX	on	-	-	-	on	close	off	on	release	Fire	-	-	off	off	Fire CX	Fire C
All out evacuation switch at SVR (White manual call point) operation	Fire	Fire X	Fire	Fire	Fire	Fire	-	Fire	on	off	-	-	-	-	-	on	release	Fire	-	-	off	off	Fire X	Fire X
Zone A heat/smoke detector operation	-	Alert A	-	Alert	-	-	Start	Alert AX	on	-	off	close	on	-	on	on	release	Alert	-	-	-	-	Alert AX	Alert AX
Zone B heat/smoke detector operation	-	Alert B	-	-	Alert	-	-	Alert BX	on	-	off	close	off	close	on	on	release	Alert	-	-	-	-	Alert BX	Alert BX
Zone C heat/smoke detector operation	-	Alert C	-	-	-	Alert	-	Alert CX	on	-	off	-	on	close	on	on	release	Alert	-	-	off	off	Alert CX	Alert CX
Detectors adjacent fire door A-B operation	-	Alert X	-	Alert	Alert		-	Alert X	on	-	-	close	-	-	on	on	release	Alert	close		-	-	Alert X	Alert X
Detectors adjacent fire door B-C operation	-	Alert X	-	-	Alert	Alert	-	Alert X	on	-	-	-	-	close	on	on	release	Alert		close	-	-	Alert X	Alert X
Escalation time reached (Zone A)	Fire	Fire	-	Fire	Alert	-	-	Fire A	on	-	off	-	on	-	on	on	release	Fire	-	-	-	-	Fire X	Fire X
Local Remote Display Unit reset[2]	-	Reset[4]	-	-	-	Reset[4]	Stop	Reset[4]	Reset[5]	-	Reset[4]	Reset[5]	Reset[4]	Reset[5]	Reset[5]	Reset[4]	Reset[5]	Reset[4]	Reset[5]	Reset[4]	no	Reset[5]	Reset[4]	Reset[5]
Fire alarm defect	Defect	Defect	-	-	-	-	-	-	on	-	-	-	-	-	-	-	-	Defect	-	-	-	-	-	Defect
Fire alarm isolate	Isolate	Isolate	-	-	-	-	-	-	on	-	-	-	-	-	-	-	-	Isolate	-	-	-	-	-	Isolate

NDY
A TETRA TECH COMPANY

REAL WORLD

Totally inadequate compliance schedule – list of specified systems and testing standards

- Compliance schedule lists:
  - specified systems
  - standards relevant to the specified system
- Compliance schedule omits:
  - the interfaces between the specified systems
  - Details on the specified systems
  - Fire control matrices
  - Mechanical control matrices
  - Original commissioning data

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Real World Interface testing

- How can the IQP's inspecting the interfaced specified systems provide a 12A form to the building owner?
- How can the building owner meet the requirements of s 108 (2) of the Building Act 2004

> (2) The purpose of a building warrant of fitness is to ensure that the specified systems stated in the compliance schedule are performing, and will continue to perform, to the performance standards for those systems that are set out in the relevant building consent.

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Real world interface testing – what needs to be done

- What needs to be done?
- The IQP's, with or without the building owner need to create the "Ideal world scenario" previously described.

NDY
A TETRA TECH COMPANY

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Real world interface testing – consequences

- The consequences of not doing it are:
- committing offences under s 108 (5) of the Building Act 2004.

(5) A person commits an offence if the person—

(aa) fails to supply to the territorial authority the building warrant of fitness in accordance with subsection (1); or

(a) fails to display a building warrant of fitness that is required to be displayed under this section; or

(b) displays a false or misleading building warrant of fitness; or

(c) displays a building warrant of fitness otherwise than in accordance with this section.

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Real world interface testing – Upgrade the compliance schedule

- The process of building a properly completed compliance schedules will probably involve:
  - revisiting the building Fire Report(s)
  - involve engaging a fire engineer.
  - involve engaging design engineers for other interfaced systems
  - creating a detailed fire control matrix
  - re-commissioning the interfaced specified systems

TESTING OF INTERFACES BETWEEN SPECIFIED SYSTEMS

Real world interface testing – Upgrade the compliance schedule

- The updated compliance schedules will need to be put forward as a recommendation to the BCA to amend the compliance schedule.

SUMMARY

- Understand your legal requirements
- Make sure you are working from a compliance schedule that adequately covers the maintenance and testing including details for interface testing.
- Walk away if you are being coerced into signing a misleading 12A form