VICTORIAN BUILDING AUTHORITY

Building Surveyor Audit Program

Volume 1 Class 2 – 9 Buildings

January 2021 – December 2021

VICTORIA State Government

ABORIGINAL ACKNOWLEDGEMENT

The VBA respectfully acknowledges the Traditional Owners and custodians of the land and water upon which we rely. We pay our respects to their Elders past, present and emerging. We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life.

We embrace the spirit of reconciliation, working towards equality of outcomes and an equal voice.

Authorised by the
Victorian Building Authority
733 Bourke Street
Docklands VIC 3008

Available online at **www.vba.vic.gov.au**

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ACRONYMS

RBS	Relevant Building Surveyor
DtS	Deemed-to-Satisfy
NCC	National Construction Code
NCZ	Non-Climbable Zone

1. ABOUT

The Victorian Building Authority's (VBA) Building Surveyor Audit Program (BSAP) is a regulatory initiative that seeks to identify and reduce non-compliant building work in Victoria. The program involves the desktop review of building permit and occupancy permit documentation to ensure registered building surveyors are carrying out their functions correctly. This report details the BSAP findings.

1.1 VBA Compliance and Enforcement

The Victorian Building Authority (VBA) is responsible for monitoring and enforcing compliance with the *Building Act 1993* (the Act) and associated regulations and guidelines, including the National Construction Code and Code of Conduct for Building Surveyors in Victoria.

The Act provides for plumbing and building work to be carried out so that it meets minimum standards of safety, health, and amenity. It requires people and companies undertaking building and plumbing work to be registered or licensed practitioners. It also provides for various enforcement tools to be used where individuals and companies fail to comply with the requirements of Act.

The VBA's compliance and enforcement decisions are made according to the Compliance and Enforcement Policy.

The VBA's twice-yearly Compliance and Enforcement Report is designed to give industry, practitioners, and the community an insight into the VBA's activities. To safeguard Victoria's future, the VBA is strengthening its capacity to take firm action when needed to keep Victorians safe and hold practitioners to account. As Victoria's building and plumbing regulator, the VBA'S starting point is that individuals want to do the right thing. That's why we are enhancing our risk- based regulatory model that will encourage and incentivise good behaviour, while discouraging poor performance.

1.2 Building Suveyor Audit Program Benefits

The benefit of the Building Surveyor Audit Program (BSAP) is to improve safety and compliance outcomes for building work in Victoria.

Building surveyors perform a crucial role in the building approval process to ensure we live in a safe, accessible and energy efficient built environment. The Building Act 1993 gives building surveyors in Victoria the power to issue building permits, occupancy permits and enforce compliance with the Act, Regulations and National Construction Code.

Section 17 of the Act allows for applications for building permits to be made to a municipal building surveyor or private building surveyor appointed under Part 6 of the Act. Section 24 of the Act requires, among other things, that the relevant building surveyor refuse to issue a building permit unless he or she is satisfied that the building work and the building permit will comply with the Act and the building regulations.

As building surveyors perform a crucial role in the building approval process monitoring their compliance provides an avenue for oversight of the building industry's performance.

Information and intelligence gathered through BSAP enables the VBA to identify areas of concern warranting further investigation and possible need for improvement of industry practice and the regulatory framework.

Data from the audits is used to guide education as well as the enforcement and compliance activity.

The results of audits are communicated to Practitioners. Whilst BSAP has an educative nature, where non-compliances are identified registered building practitioners may, among other compliance measures, be subject to enforcement action in line with the VBA's compliance and enforcement activities.

1.3 What are our powers?

Section 197 of the Building Act 1993 (the Act) provides that it is a function of the VBA to:

(a) monitor and enforce compliance with the Act and regulations,

(b) supervise and monitor the conduct and ability to practice of registered building practitioners,

(c) provide information on matters relating to –
   i. building standards; and
   ii. the regulation of buildings, building work and building practitioners

(d) provide information and training to assist persons and bodies in carrying out functions under this Act or the regulations

1.4 What was the scope?

The scope of this audit is Class 2-9 buildings with a mixture of rise in storeys located throughout the State for compliance against the performance requirements of sections B, C, D, E and F of the National Construction Code Volume 1.

1.5 How did we do it?

The VBA carried out desktop audits on 88 Class 2-9 buildings located within 34 municipalities in Victoria. The locations of the audits are shown in Figure 1.

The practitioners and buildings were selected using a risk based selection criteria utilising data from across the VBA such as PIP results, complaints data and practitioner discipline to identify areas of high risk. Site selection criteria considers data such as building use eg. places for sleeping, rise in storeys, occupant numbers, type of construction and location, such as bushfire prone areas thus leading to a focus on class 2 buildings.

To ensure a high value audit program the audits are scoped based on risk assessment to align with a focus on known risks and the VBA Register of Harms, including:

- fires in buildings
- building collapse or structural damage
- children drowning
- threat to life and safety
- water ingress
- fit for purpose.

The risk based nature of the program means that the audits do not assess compliance with all NCC requirements and as such the audited permit documents may have other unidentified compliance issues.

A total of 66 Building Surveyors were responsible for the sites selected.

This consisted of:

- 63 Class 2 apartment buildings
- 1 Class 3 residential building
- 1 Class 4 dwelling building
- 16 Class 7 storage type buildings and
- 7 Class 8 processing buildings.

The Section 30 building permit documentation was used to assess each building for sufficiency of the information to enable the Building Surveyor to determine compliance, and whether compliance was achieved against Performance Requirement BP1.1, BP1.2, BP1.4, CP1 to CP9, DP2 to DP7, EP1.1 to EP1.6, EP2.1 to EP2.1 to EP2.2, EP4.1 to EP4.3, FP1.4 and GP5.1 of the National Construction Code (NCC), Building Code of Australia (BCA) Volume One.

Where there was no performance solution documented to satisfy the performance requirement, the assessment was undertaken against the Deemed-to-Satisfy requirements (DtS).

Figure 1. Audit locations in Victoria

1.6 Action taken by the VBA

Where compliance risks were identified, the VBA sent notification to Relevant Building Surveyor (RBS). Typically, these notifications require the practitioners to:

- provide any relevant documentation (such as an approved performance solution, engineering drawings or certificate of compliance from a registered practitioner) showing how the work meets the requirements under the building legislation – this is because practitioners are currently not required to lodge this documentation with the VBA; or
- provide the VBA with proof the work has been/ will be brought into compliance (e.g. amended building permit).

The RBS is expected to manage any rectification required, using their enforcement powers.

Although the program has an education focus, where serious non-compliances are identified practitioners are referred for further investigation in line with the compliance and enforcement policy.

1.7 Next steps

The next steps after publishing this report will be to use the information collected from the audits to:

- engage with industry stakeholders about causes, challenges, and ways to improve
- developing an education strategy and provide education to building practitioners
- allow for targeting of issues identified through proactive inspections and other regulatory functions
- monitor for improvement of issues identified
- advocate for legislative changes and reforms to improve regulatory process.

2. AUDIT FINDINGS

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Of the 88 audits completed, all audits had at least one item where it was considered that the RBS could not have determined that compliance was achieved.

The results of the audits for sufficient documentation for the RBS to make a determination on compliance varied from 18% for weatherproofing to 91% for provisions of escape.

Where there was sufficient information to determine compliance, the results for compliance varied from 18% for weatherproofing to a high of 89% for provisions for escape. Overall, when the results from the 88 audits were averaged, of the 110 clauses assessed

there were found to be on average 17 items per audit where the RBS could not have been satisfied that compliance was achieved.

3. DOCUMENTATION INSIGHTS

Documentation insufficiencies across all audits are shown in Figure 2.

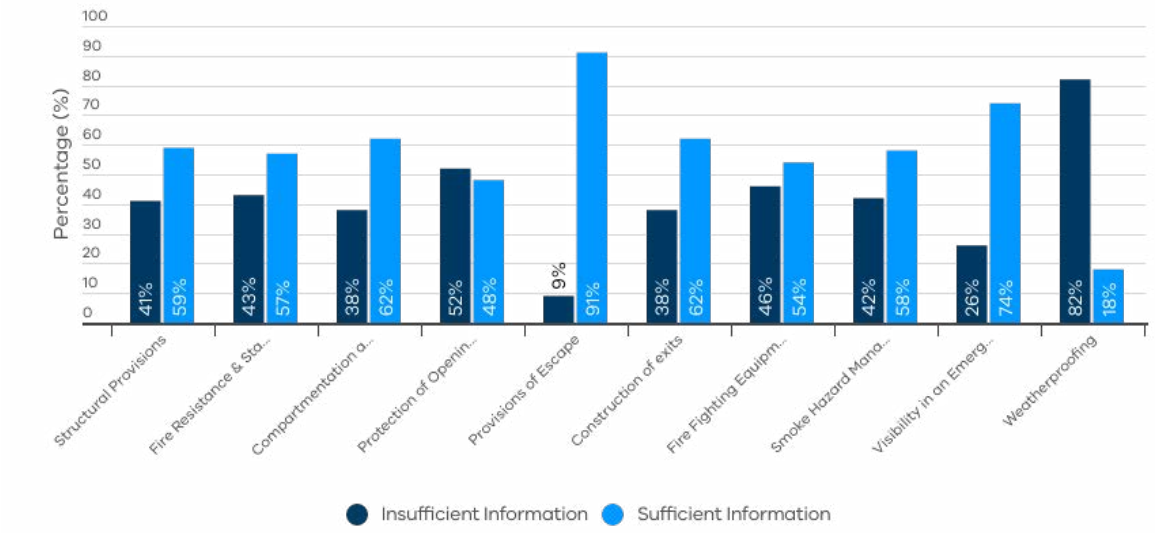

Figure 2. Documentation insufficiencies across all audits, where applicable

4. COMPLIANCE INSIGHTS

The compliance levels, that is where compliance had been demonstrated, across all audits are shown in Figure 3.

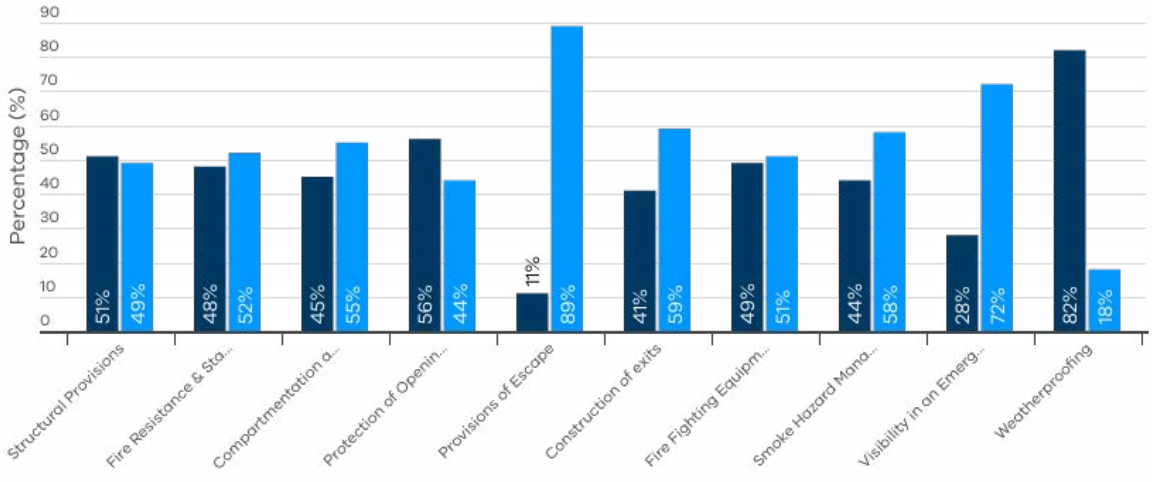

Figure 3. Compliance level across all audits

The average prevalence of compliance not being demonstrated based on the rise in storeys[1] across all audits are shown in figure 4.

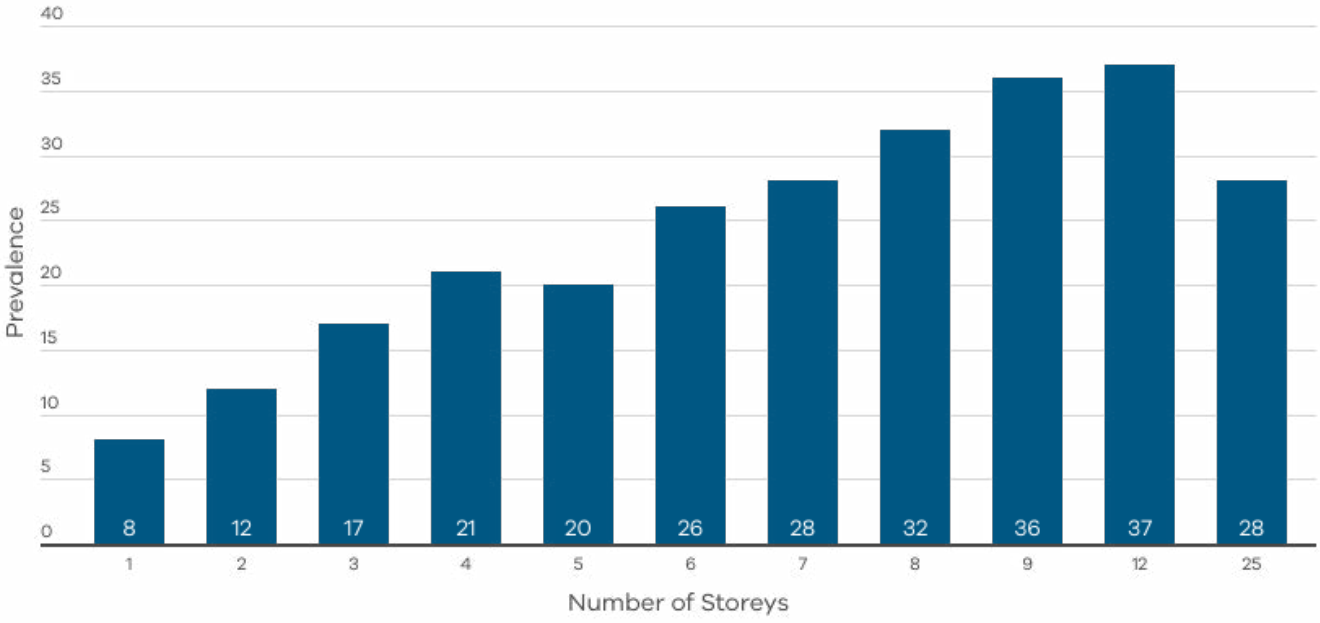

Figure 4. Compliance issues across all audits per number of storeys[1]

The average prevalence of items where compliance was not being demonstrated based on NCC provisions across all audits are shown in figure 5.

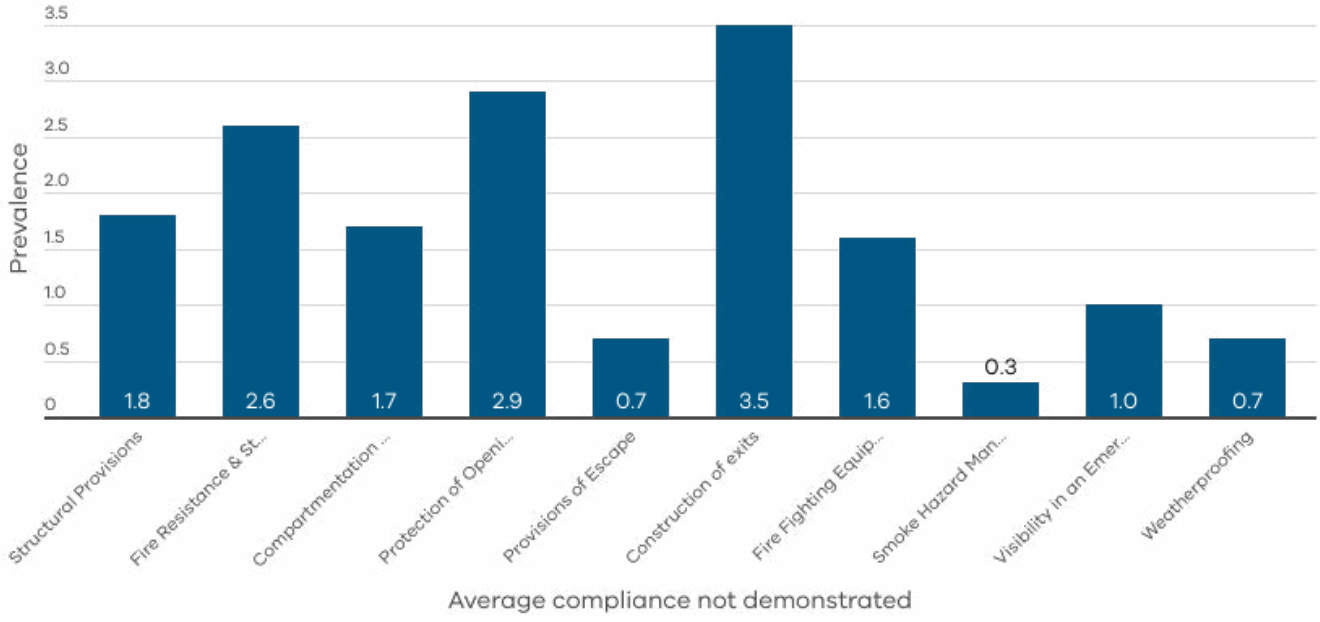

Figure 5. Average compliance not being by NCC provisions across all audits

[1] Limited number of audits undertaken on 7, 8, 9, 12 and 25 storey buildings and none on 10, 11,13-24 or 26 plus storeys for the period.

5. SPECIFIC COMPLIANCE INSIGHTS

5. SPECIFIC COMPLIANCE INSIGHTS

The following sections provide details of specific types of non-compliances identified in the audits.

5.1 Section B – Structure

In most cases the RBS relied on a compliance certificate issued under s.238 of the Act. Where these certificates had been relied on there were issues identified with them, that included:

- the certificate did not address all the relevant performance requirements and standards e.g. standards from the AS1170 series were missing
- the wrong volume and/or version of the NCC was used eg the certificate referenced Volume 2 rather than Volume 1 or NCC2016 rather than NCC2019
- the certificate had the wrong building characteristic such as rise in storeys, effective height, classification, and
- the certificate was not in the correct form e.g. not addressed to the RBS.

Other issues identified in audits included:

- earthquake loading not addressed, and
- no evidence that warnings produced in calculation software were addressed.

5.2 Section C - Fire Resistance

5.2.1 Fire Resistance and Stability

5.2.1.1 Type of Construction

Of the 88 buildings audited:

- 36 required Type A construction
- 33 Class 2 building required Type B construction unless clause C1.5 can be applied
- 19 required a minimum of Type C Construction
- 37 had a rise in storey of two[2].
- 17 buildings were either listed as Type B construction or did not have the type of construction on the permit.
- 35 Class 2 buildings were listed as type C construction on the Form 2 Building Permit
- 5 of these 35 type C buildings contained 3 storeys
- 11 of these 35 type C buildings contained a secondary class of building.
- clause C1.5 concession could not be applied to 15 permits that were listed as Type C
- the 11 permits where type C was incorrectly used were issued by eight unique building surveyors. Of these eight:
    - » one permit was issued by a Building Surveyor limited with nine years registration
    - » ten permits were issued by Building Surveyors unlimited; all have at least nine years of registration; four of whom have more than 20 years of registration.

5.2.1.2 Specification C1.1

Issues identified with the application of Specification C1.1, when a performance solution was not used, included:

- specifying the incorrect Fire Resistance Level (FRL)
- not specifying an FRL where an FRL was required
- not having the appropriate evidence of suitability to confirm that the FRL would be achieved
- relying on a Redbook CSR system, however the system detailed on the plan was not identical to that in the Redbook and there was no report from an Accredited Testing Laboratory (ATL) to support the change from the tested prototype; and
- using internal CSR wall systems for external wall types.

[2]The majority of building surveyors that are issuing class two only had a rise in storeys of [2] and this also includes other building classes

Issues for compliance were also identified where a performance solution was used. These included:

- the performance solutions not addressing all the deviations from the DtS e.g. only dealt with reduced FRL in the top story whereas the external walls on all levels were proposed to have reduced level.

It was identified that requirements of the Fire Engineering Report (FER) to support the performance solution were not detailed in the plans and some requirements of the FER could not be achieved. An example of this was that a smoke lobby was required in the basement, however the plans showed an open stair.

5.2.1.3 Calculation of Rise in Storeys

There were two audits where the rise in storeys were incorrectly calculated by the RBS. These occurred on:

- sloping sites where the RBS failed to identify that there was a non-street frontage elevation/s that had a greater number of storeys.

5.2.1.4 Clause C1.8 Lightweight construction (Specification C1.8)

There were 43 audits where compliance with C1.8 was not demonstrated. This occurred from:

- the failure to have evidence of suitability to demonstrate that the material would comply
- wall types that were approved on the plan were based on a CSR system, however the referenced system was not identical to that in the CSR Redbook, and
- wall types were approved based on an internal wall system, when it was an external wall.

5.2.1.5 Non-combustibility and fire hazard properties

There were 40 audits where the RBS could not have been satisfied that the external wall would be non-combustible.

Key findings include:

- non-compliances arose from having insufficient evidence of suitability that the material, including insulation, was non-combustible
- an RBS, who had previously been sanctioned by the VBA for use of Aluminium Composite Panels (ACP) on Type A buildings, issued a permit which included the use of ACP, without suitable evidence that the material was non-combustible, and
- 63 audits did not have sufficient evidence of suitability to confirm that all the lining materials in the building had the required fire hazard properties and complied with specifications C1.10, where not exempt.

5.2.2 Compartmentation and separation

There was a total of 149 occurrences for applicable items in compartmentation and separation where compliance was not demonstrated in 88 audits.

There were:

- 8 audits where the RBS could not have been satisfied that there was vertical separation of openings in type A construction
- 3 Class 2 buildings with insufficient separation provided to public corridors bounding Sole-Occupancy Unit (SOUs), and
- 7 buildings with insufficient separation of equipment listed in C2.12(a).

The most prevalent non-compliances were:

- the incorrect wall FRL and no performance solution to reduce the FRL, or the nominated wall system not achieving the required FRL, where classifications in same storeys were required to be separated either in accordance with the DtS or the requirements of the fire engineering report forming part of the performance solutions
- the incorrect floor FRL and no performance solution to reduce the FRL, or the nominated floor system not achieving the required FRL where classification in different storeys were required to be separated either in accordance with the DtS or the requirements of the fire engineering report forming part of the performance solutions
- the FRL construction in the enclosing walls and doors of electricity supply systems was not detailed in 26 audits, most prevalently in main switchboards which sustain emergency equipment operating in emergency mode
- 19 audits did not demonstrate the required FRL or had openings in the firewall that were not compliant with C3 protection of openings which reduced the wall's FRL, and
- 19 audits had lift shafts that were required to be separated from the remainder of the building, with the incorrect FRL and no FRL around the lift shaft being nominated.

5.2.3 Protection of Openings

The compliance rate for protection of openings was one of the lowest at 44%.

Sufficient information was only provided in 48% of the audits. On average there were 2.7 occurrences where compliance was not demonstrated per audit for part C3 of Volume 1.

These non-compliances were mainly related to:

- protection of openings in external walls
- acceptable methods of protection
- openings in fire-isolated exits
- openings in floors and ceilings for services
- openings for service installations.

5.2.3.1 Protection of openings in external walls

Clause C3.2 protection of openings was addressed by a performance solution or a combination of solution in 47 of the 66 buildings that required openings in external walls to be protected.

It was identified in the audits that:

- where performance solutions for protection of openings were addressed using a performance solution via a FER, not all openings that required protection had been covered by the FER, and
- that in the FER, a number of options were proposed as solutions for protecting the openings, such as glazing thickness, sprinkler protection or screening. However, the option being used was not detailed in the plans.

5.2.3.2 Acceptable methods of protection

Where no performance solution was proposed for the protection of openings it was assumed that a DtS solution was being proposed.

Key findings:

- in 22 of the audits, it was identified that there was either insufficient information to determine compliance or compliance was not achieved
- insufficient information included not having the required evidence of suitability such as a test report that the protection method would achieve compliance
- non-compliances included doors not being the required thickness, not meeting the requirements of specification C3.4 or not being nominated as requiring an FRL, and
- there were no test reports that the window would comply with the specification and that they were identical to the tested prototype.

5.2.3.3 Openings in fire-isolated exits

Opening in fire-isolated exits in 10 of the audits did not have the required protection. This included:

- insufficient evidence of suitability that the opening achieved the FRL, and
- did not have the required FRL nominated.

5.2.3.4 Service penetrations in fire-isolated exits

Where a report and consent or a performance solution was not developed, there were 2 audits which had services penetrating the fire-isolated exits which were:

- not electrical wiring permitted under D2.7(e)
- ducting not associated with a pressurisation system, and
- a water supply pipe not for fire services.

5.2.3.5 Openings in fire-isolated lift shafts

In 16 of the audits which had lift shafts that required the openings to the lift shafts to be protected there was:

- no evidence that the lift shaft opening would comply with AS1735.11
- no specification that the opening was required to be protected, and
- no evidence of suitability that the opening complied with the standard.

5.2.3.6 Bounding construction: Class 2 and 3 buildings and Class 4 parts

In 20 of the audits bounding construction of a public corridor did not comply or have sufficient information to demonstrate compliance had been achieved. There were:

- doorways to public corridors that did not have the required FRL nominated
- audits that did not have a test report that demonstrated the door achieved the required FRL, and
- audits where travel along open balconies or the like to an exit required the passing of openings in an external wall that were not provided with the required protection.

5.2.3.7 Openings in floors and ceilings for services

Where a service passes through a floor or ceiling it is required to have a FRL in relation to integrity and insulation. In 38 of the audits the plans and specifications did not show:

- that the elements penetrating the floor or ceiling would comply with the requirements
- details that a penetration was required to comply
- how the penetration would comply such as the material/product being used to protect the penetration, or
- test reports of the product being used to determine that it would comply with the requirements.

5.2.3.8 Openings for service installations

In 39 of the audits there was insufficient information to demonstrate that the services penetrating elements required to have a FRL in relation to integrity and insulation that the FRL would be maintained. Missing information included:

- not detailing that a penetration was required to comply;
- how the penetration would comply such as the material/product being used to protect the penetration; and
- no test report of the product being used to determine that it would comply with the requirements.

5.2.3.9 Construction joints

32 of the audits did not show compliance with C3.16 for the construction joints, this included:

- no nomination that the construction joints were to be protected, and
- where protection was nominated, there was no specification or evidence of suitability that showed the construction joints would be identical to a prototype that when tested in accordance with AS1530.4 would comply.

5.3 Section D – Access and Egress

Performance requirements DP2 to DP7 were considered as part of the audit. Where there were no performance solutions provided, the building was assessed against the DtS requirements of D1 Provision for escape and D2 Construction of exits.

5.3.1 Provision for Escape

Provision for escape had the highest compliance rates in the audits, with 89% compliance achieved.

This was achieved through a mixture of performance solutions and DtS solutions or a combination.

Key finding for provision for escape are:

- all buildings that required a fire isolated exit had one
- most buildings that did not have the required distance between exits had a performance solution that addressed this,
- there were two audits where travel via non-fire isolated stairs did not comply with the DtS and there was no performance solution,
- there was one audit where a section of the path of travel to an exit was less than 1m and there was no performance solution,
- in 27 of the audits a performance solution was used for at least one of the exits,
- one of the most common performance solutions was for the number of exits for the basement,
- in most cases the basement was provided with only one exit under a performance solution,
- generally, the number of exits provided throughout other parts of the building complied with D1.2,
- there were three audits where the number of exits required did not comply with the DtS and there was no performance solution,

- two audits did not have the required number of exits and did not have a performance solution were basements that had only had one exit
- 43 of the audits utilised a performance solution or a combination of solutions for travel distances
- four audits had a non-compliance with the DtS for travel distances
- in three of the audits there were errors identified in the performance solutions in provisions for escape, and
- errors in the measured travel distances nominated in performance solution led to incorrect calculations for travel times to the exit.

5.3.2 Construction of Exits

There was a compartively high compliance rate generally in the construction of exits, with a 59% compliance rate achieved.

Despite this there were on average 3.5 items where compliance was not demonstrated per audit. These non-compliances were mainly related to:

- handrails
- protection of openable windows
- barriers to prevent falls
- landings
- operation of latch (Vic D2.21a)
- signs on doors, and
- goings and risers.

Key compliance findings:

- D2.3 Non fire-isolated stairways and ramps with only one of the 21 audits with non-fire isolated stairs having a non-compliance,
- of the 15 audits where D2.4 Separation of rising and descending stair flights applied, 13 had a compliant solution, with 10 satisfied via a performance solution
- 14 audits had installations in exits and paths of travel that did not have sufficient information to show that the installations would comply with D2.7
- there was one audit which had an enclosed space under a non-fire isolated stair that did not have the required FRL
- four of the six buildings that had a fire isolated passageway showed compliance with D2.11, and
- there were 10 occasions where thresholds to doorways did not meet D2.15.

5.3.2.1 Roof as open space

There were four occasions where the exit discharged onto the roof of the basement level or a lower level and the FRL of 120/120/120 was not nominated or confirmed in the structural engineering.

5.3.2.2 Goings and risers

Stairs in 42 of the audits did not show adequate detail for the RBS to determine that the goings and risers would comply. This included:

- no section details or dimensions nominated on the stairs, and
- only general notes about goings and risers to comply with table D2.13.

5.3.2.3 Landings

42 of the audits did not show compliance for landings. Key issues included:

- the landings not having dimension or no details of the landing
- the landing dimension was less than that required
- slip resistance was not nominated, and
- no evidence the slip resistance complied with AS4586.

5.3.2.4 Barriers to prevent falls

28 of the audits did not show how a barrier required to prevent falls would comply with D2.16. Barriers did not:

- have the heights nominated on them
- details of the gaps or horizontal members, and
- one audit identified horizontal members in the barrier that could facilitate climbing and the solution for dealing with this by using the provisions from AS1926 was not documented in a performance solution.

5.3.2.5 Handrails

In 31 of the audits there was insufficient information to determine that the handrails complied with D2.17. Missing information included:

- plans not showing that a handrail was required on at least one side of the stairs
- no details of the height that the handrail was at
- that there were not obstructions that would break the handhold; and
- that they were provided in accordance with AS1428.

5.3.2.6 Fixed platforms, walkways, stairways and ladders

Where a fixed platform, walkaway, stairway or ladder serving machine rooms and the like or other non-habitable areas such as attics did not comply with D2.13, D2.14, D2.16 and D2.17 it is required to comply with AS1657. There were eight audits where such structures did not have details of how they would comply with the standard.

5.3.2.7 Swinging doors

Nine of the audits had swinging doors that did not comply with D2.20. These doors had:

- encroachments on stair landings, and
- did not swing in the direction of egress.

5.3.2.8 Operation of latch (Vic D2.21a)

There was a high number, 29, of the audits that did not demonstrate that the latches on doors in required exits would operate as required by D2.21. In the audits there:

- were no door hardware schedules, and
- doors were not nominated as being required to have a latch that complies with D2.21.

5.3.2.9 Signs on doors

There was no signage, or signage scheduling nominating that doors that were required to have signage alerting a person to the operation of the door in 15 of the audits. This signage is required to ensure doors that provide protections to exits, and separate exits from other areas of the building, are not obstructed to hinder occupant evacuation, or kept open allowing smoke and fire to spread, compromising occupant evacuation.

5.3.2.10 Protection of openable windows

Certain windows in class 2 buildings are required to be protected to prevent injury to building occupants. In construction of exits this item had one of the highest non-compliances with 33 audits not having sufficient detail to show that windows had the required protection. These audits did not have any details of:

- how the window opening was restricted
- the window being required to be restricted, and
- test reports or evidence that showed they would withstand 250N horizontal force.

5.4 Section E - Services and Equipment

Sufficient information was provided 54, 58 and 78 percent of the time for firefighting equipment, smoke hazard management and visibility in an emergency, exit signs and warning systems respectively which resulted in compartively high compliance rates. Where there was sufficient information provided, compliance was achieved in:

- 51% for firefighting equipment
- 58% for smoke hazard management, and
- 72% for Visibility in an emergency, exit signs and warning systems.

5.4.1 Firefighting equipment

5.4.1.1 Fire hydrants

Where a DtS solution was not used a report and consent was obtained from the relevant authority for:

- hydrant coverage shortfalls, and
- hydrants on mid landing and the use of mag flow meters.

Issues identified in the audits for fire hydrants included:

- no report and consent for a hydrant on a mid-landing
- no report and consent for coverage shortfalls
- no pressure flow tests to support the use of street hydrant, and
- The architectural drawings and services drawings having conflicting information about the location of the hydrants.

5.4.1.2 Fire hose reels

48 of the audits required fire hose reels in the building. Primarily the carpark.

- six buildings did not detail that fire hose reels were required in accordance with the DtS or have a performance solution to omit them, and
- one building had a fire hose reel that passed through a fire door and did not have a performance solution to allow this variation for the DtS

5.4.1.3 Sprinklers

Of the 27 buildings that required sprinkler protection:

- 9 used DtS provisions
- 18 had a combination of DtS and performance solutions
- sprinklers were provided to balconies where required
- performance solutions were obtained to remove sprinklers in bathrooms above showers and in lift shafts, and
- report and consents were obtained for sprinkler valve locations as required by regulation 129 where they did not comply with the standard.

5.4.1.4 Portable fire extinguishers

- There were three audits which had a performance solution for portable fire extinguishers
- 31 of the audits did not have plans that showed the locations of portable fire extinguishers, and
- in audits that that did show the locations of portable fire extinguishers, there were two audits that did not show portable fire extinguishers to all required locations, this included not specifying them in the public lobby.

5.4.1.5 Fire precautions during construction

48 of the audits did not have details of fire precautions required during construction.

Where fire precautions during construction were nominated:

- this was primarily by the use of conditions on the permit, and
- permit conditions that had limited information, however there were audits which provided good detail of the type of precautions required and when/ where these were required.

A potential risk for compliance with fire precautions was identified in staged permits for buildings over 12m in effective height where a DtS solution is being used to satisfy EP1.5 Fire-fighting services in buildings under construction. Where a building has reached an effective height of 12m the required fire hydrant and hose reels, and the required booster connections must be installed. Where a staged permit has been issued for structural works, these building works should not progress beyond 12m effective height if the building permit for the fire services has not yet been issued.

5.4.1.6 Provision for special hazards

Six of the audits were considered to have a special hazard. These special hazards were car stackers, as the performance of the building would differ from that with a standard carpark. The six buildings with car stackers, were installed with sprinkler systems complying with the FRV (MFB) guideline 32 for car stackers.

5.4.2 Smoke hazard management

Generally smoke exhaust systems were provided where required. In 28 of the audits there was insufficient information or incorrect information detailed on the plans which included:

- smoke detection systems not provided to locations required to have detection, such as in storage areas
- there were plans that did not show certain apartments as having smoke detection systems
- there was missing information in specifications, such as the detection system required to be connected to mains power or building occupant warning system, and
- there were plans that did not reflect requirements of the FER for additional detection systems to satisfy a performance solution e.g. thermal/heat detector hasn't been indicated on fire service plan to the lift shaft.

Where smoke detection system layouts had been provided the nominated locations were generally in accordance with the requirements.

5.4.3 Visibility in an Emergency, Exit Signs and Warning Systems

5.4.3.1 Emergency lighting requirements

Emergency lighting was required in 63 of the audits and there were no performance solutions nominated for EP4.1 in any of the buildings.

24 audits did not show compliance with the DtS requirements. This included:

- buildings that did not have emergency lighting nominated in fire isolated stairs or in public corridors, and
- did not show or specify that the design and operation of the emergency lighting would comply with AS/NZS 2293.1 as required by clause E4.4.

5.4.3.2 Exit signs

There were 17 audits where compliance for exit signs was not demonstrated. This included:

- plans that did not show exits signs where they were required
- exit signs were nominated in the incorrect location, and
- compliance with AS/NZS 2293.1 as required by clause E4.8 was not specified.

5.4.3.3 Direction signs

In 10 of the audits that required directional signage compliance with the DtS requirements were not achieved because:

- there were areas of the building that an exit was not readily apparent to an occupant and there was no directional signage, and
- a basement carpark views of the exit were blocked by shafts/storage areas.

5.5 Section F – Health and Amenity

The audits focused only on performance requirement FP1.4.

5.5.1 Performance requirement FP1.4 Weatherproofing

82% of audits did not demonstrate that performance requirement FP1.4 for weather proofing was satisfied.

This was the result of:

- there not being a performance solution completed for any external walls
- a performance solution not being completed for all external wall systems
- the evidence of suitability being relied on was not appropriately assessed, eg limitations and conditions of Codemark not met, and
- where a Codemark or the like was relied on for the external wall systems the RBS did not undertake a determination as required under s.38 of the Act.

6. GENERAL OBSERVATIONS

6. GENERAL OBSERVATIONS

A key observation from the audits was that requirements detailed in performance solutions were not always detailed on plans. For example, a fire engineering report required a smoke lobby to be provided, however the plans did not detail the smoke lobby. Whilst the performance solution would be compliant if constructed in accordance with these requirements, this information was not detailed on the plans. This creates the risk that when the building is constructed the smoke lobby will not be constructed, thus potentially resulting in the as constructed building not meeting the performance requirements.

Often it is considered that the plans and specifications lacked sufficient details for the RBS to make a determination that the performance requirement had been complied with. This was caused by a lack of detailing in the plans and a lack of evidence of suitability to support the use of a product, form of construction or material. Part A governing requirements set out the form in which evidence of suitability is required. This can for example be in the form of a certificate, test report or another form of documentary evidence. Further to this, elements requiring an FRL have further requirements on the evidence of suitability required. Test reports demonstrating that wall systems would achieve the required FRL were not provided. There was also a lack of evidence that lining materials had the required fire hazard properties.

7. AUDIT CHALLENGES

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A challenge faced during the audits was determining whether information forming part of the building permit had not been provided or that it never existed to start with. There is no requirement for the building surveyor to list the documentation they have relied on to determine compliance on the building permit. If building surveyors were required to list all the documentation that they have relied on to make a decision on the building permit it would be easier to determine if information is missing. This would also be beneficial to those on site, as they could look at the listed documentation and know if they were missing any information. This will assist in reducing the risk of onsite non-compliance from lack of access to appropriate documentation.

Victorian Building Authority

Online
www.vba.vic.gov.au

Email
customerservice@vba.vic.gov.au

Postal Address
PO Box 536
Melbourne VIC 3001

Telephone
1300 815 127

Opening Hours
Monday to Friday, 8:30am to 5:00pm

Registered Office
Goods Shed North
733 Bourke Street
Docklands VIC 3008