

Building Documentation Audit

Volume 2 - Class 1a

July 2022 – February 2023

Aboriginal Acknowledgment

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 and present. 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.



Contents

Contents	3
1. ABOUT	6
1.1 VBA Compliance and Enforcement	6
1.2 Building Documentation Audit Program Benefits	6
1.3 What are our powers?	7
1.4 What was the scope?	7
1.5 How did we do it?	7
1.6 Audit Process	9
1.7 Action taken by the VBA	10
1.8 Next steps	10
2. AUDIT FINDINGS	11
3. DOCUMENTATION INSIGHTS	11
4. COMPLIANCE INSIGHTS	12
5. SPECIFIC COMPLIANCE INSIGHTS	13
Structure	13
Part 3.2 Footings and Slabs	13
Non-prescribed wall cladding	13
Section 238	14
Damp and Weatherproofing	15
Part 3.5 Roof and Wall Cladding	15
Part 3.5.1 Sheet Roofing	15
Part 3.5.2 Roof tiles and Shingles	16
Part 3.5.3 Gutters and Downpipes (Vic Variation)	16



3.5.4.8 Parapet cappings	18
Non-prescribed Wall cladding	18
P2.2.1 Weatherproofing	18
Fire Safety	19
Part 3.7 Fire Safety	19
Part 3.7.2 Fire separation of external walls	19
Part 3.7.3 Fire protection of separating walls and floors	20
Part 3.7.4 Smoke alarm and evacuation lighting	20
Health and Amenity	21
Part 3.8.1 Wet Areas	21
3.8.1.2 Wet Areas - Shower	21
3.8.1.2 Wet Areas - Outside Shower Area	21
3.8.1.2 Wet Areas - Adjacent Spa and Bath.....	21
3.8.1.2 Wet Areas - Other.....	22
Part 3.8.7 Condensation Management	22
3.8.7.2 Pliable building membrane.....	22
3.8.7.3 Flow rate and discharge of exhaust systems	22
Flow rate nominated but no details on whether it was to outside air or ventilated roof space.3.8.7.4 Ventilation of roof spaces	22
Safe movement and access.....	23
Part 3.9.1 Stairways and ramp construction.....	23
3.9.1.2 Stairway construction	23
3.9.1.4 Slip-resistance	23
3.9.1.5 Landings.....	23
3.9.1.6 Thresholds	23
Part 3.9.2 Barriers and Handrails	24
3.9.2.2 Barriers to prevent falls.....	24



3.9.2.3 Construction of barriers to prevent falls	24
3.9.2.4 Handrails	24
6. GENERAL OBSERVATIONS.....	25
7. POST-AUDIT ACTIONS.....	26
8. AUDIT CHALLENGES	26
Further Resources	27



1. ABOUT

The Victorian Building Authority's (VBA) Building Documentation Audit Program (BDAP) is a regulatory initiative that seeks to identify and reduce non-compliant building work in Victoria in line with the Minister's Statement of Expectations. This includes auditing all practitioners performing permit issuing function once in a 3-year period. The program involves the desktop review of building permit and occupancy permit documentation to ensure registered practitioners are carrying out their functions correctly. This report details the BDAP 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 Documentation Audit Program Benefits

The benefit of the Building Documentation Audit Program (BDAP) 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 BDAP 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. While BDAP has an educative nature, where non-compliances are identified, practitioners which can include plumbers, builders and engineers may, among other compliance measures, be subject to enforcement action in line with the [VBA's Compliance and Enforcement Policy](#).

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 1a buildings with a mixture of storeys located throughout the state for compliance against the performance requirements of Part 2.1 Structure, Part 2.2 Damp and Weatherproofing, Part 2.3 Fire safety, Part 2.4 Health and amenity and Part 2.5 Safe movement and access of Volume 2 of the National Construction Code.

Part 2.6 Energy efficiency were not considered as part of this audit as these provisions have been the subject to previous VBA audit programs.

Part 2.7 Ancillary provisions and additional construction requirements were not considered as part of this audit as the performance requirements for Swimming pool and buildings in bushfire prone areas have been considered

as part of previous audits available on the [VBA website](#).

1.5 How did we do it?

The VBA carried out desktop audits on 49 building permits for Class 1a buildings located within 29 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 Proactive Inspection Program (PIP) results, complaints data and practitioner discipline to identify areas of high risk. Site selection criteria considers data such as building use e.g., number of storeys, construction materials and location, such as bushfire prone areas.

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 39 Building Surveyors were responsible for the sites selected.

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 P2.1.1, P2.1.2, P2.2.1, P2.2.2, P2.2.3, P2.3.1, P2.3.2, P2.4.1, P2.4.7, P2.5.1 and P2.5.2 of the National Construction Code (NCC), Building Code of Australia (BCA) Volume Two. Where there was no performance solution documented to satisfy the performance requirement, the assessment was undertaken against the Deemed-to-Satisfy requirements (DtS).



AUDIT LOCATIONS

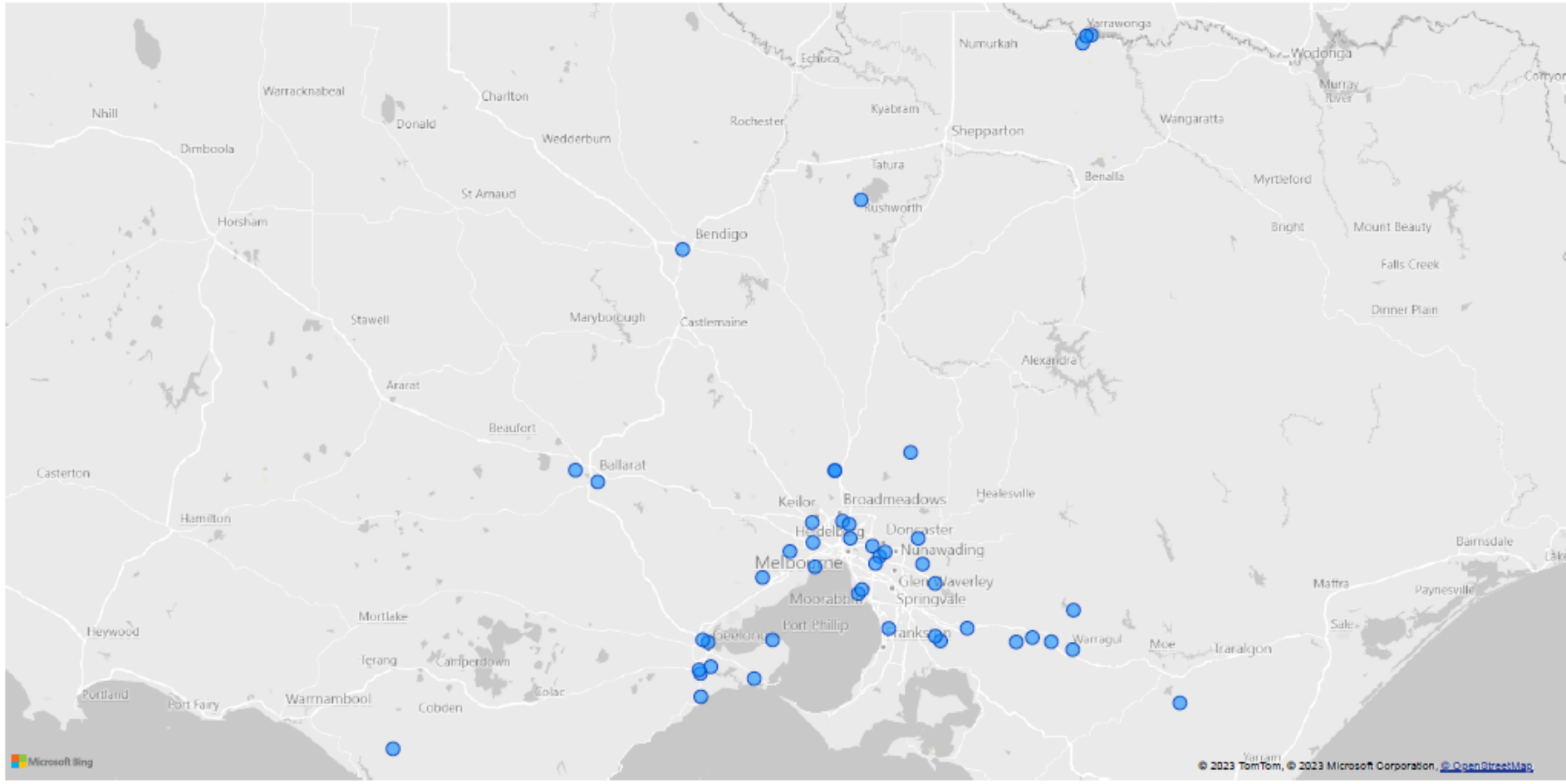


Figure 1. Audit Locations. Figure 1 is a map of Victoria showing the locations of the audits.



1.6 Audit Process

When undertaking the audits, four elements are considered:

- whether a DtS clause would be applicable to satisfy a performance requirement.
- if the clause is applicable, then whether there is sufficient information in the documentation for the Relevant BS to determine compliance.
- What compliance solution was used, e.g., deemed –to-satisfy, performance solution or a combination of these.
- Whether the information is compliant, non-compliant or unable to determine.

There are three compliance levels which are linked to sufficiency of information. These are illustrated in figure 2 Compliances levels.

An item is deemed compliant where there is sufficient information to be satisfied that the clause has been complied, with either through DtS or a performance solution, as shown in example A of figure 2 where there is sufficient information to determine the stair going and riser are DtS compliant.

Where there is insufficient information, for example where there are no details of the goings or risers, such as example B of figure 2, we would assess this as being unable to determine.

Lastly an item is marked as non-compliant when there is a physical non-compliance detailed. As shown in Example C where the going is not the minimum required.

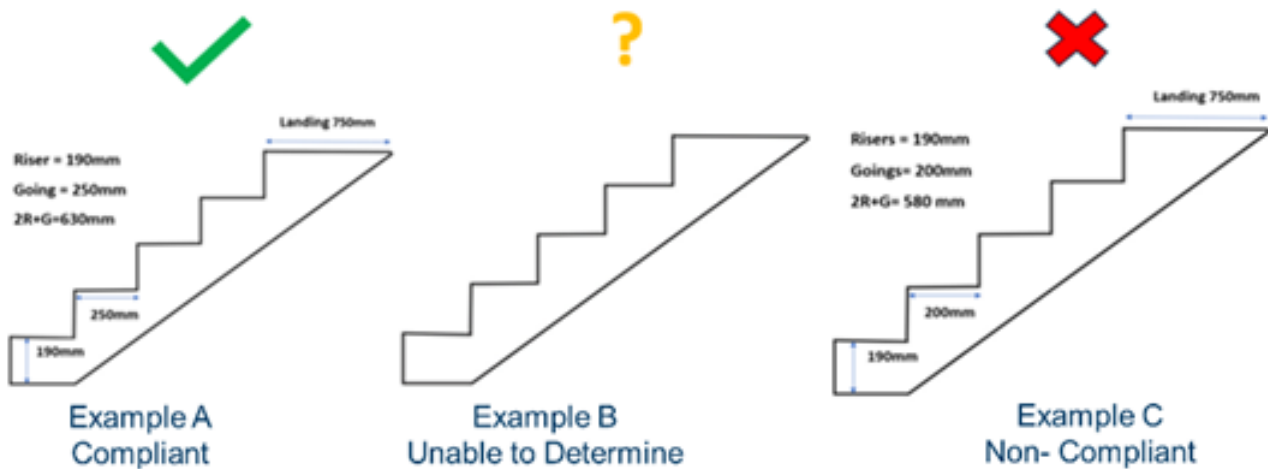


Figure 2. Compliance levels. Figure 2 shows three different stairs with their associated compliance levels.



1.7 Action taken by the VBA

Where compliance risks were identified, the VBA sent notification to the Relevant Building Surveyors (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/and 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 VBA Compliance and Enforcement Policy.

1.8 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 refined targeting of 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

Of the 49 audits completed, 24 audits had at least one item which was non-compliant.

The results of the audits for sufficient documentation for the RBS to make a determination on compliance varied from 12 per cent for smoke alarms and evacuation lighting to 61 per cent for Barriers and handrails.

Where there was sufficient information to determine compliance, the results for compliance varied from 23 per cent for

condensation management and gutters and downpipes to a high of 83 per cent for

Smoke alarms and evacuation lighting.

Overall, when the results from the 49 audits were averaged, of the 113 items assessed there were found to be on average 28 items per audit where the RBS could not have been satisfied that compliance was achieved when an item was applicable. There were on average 18 items per audit that were compliant when applicable.

3. DOCUMENTATION INSIGHTS

Documentation insufficiencies across all audits are shown in Figure 3.

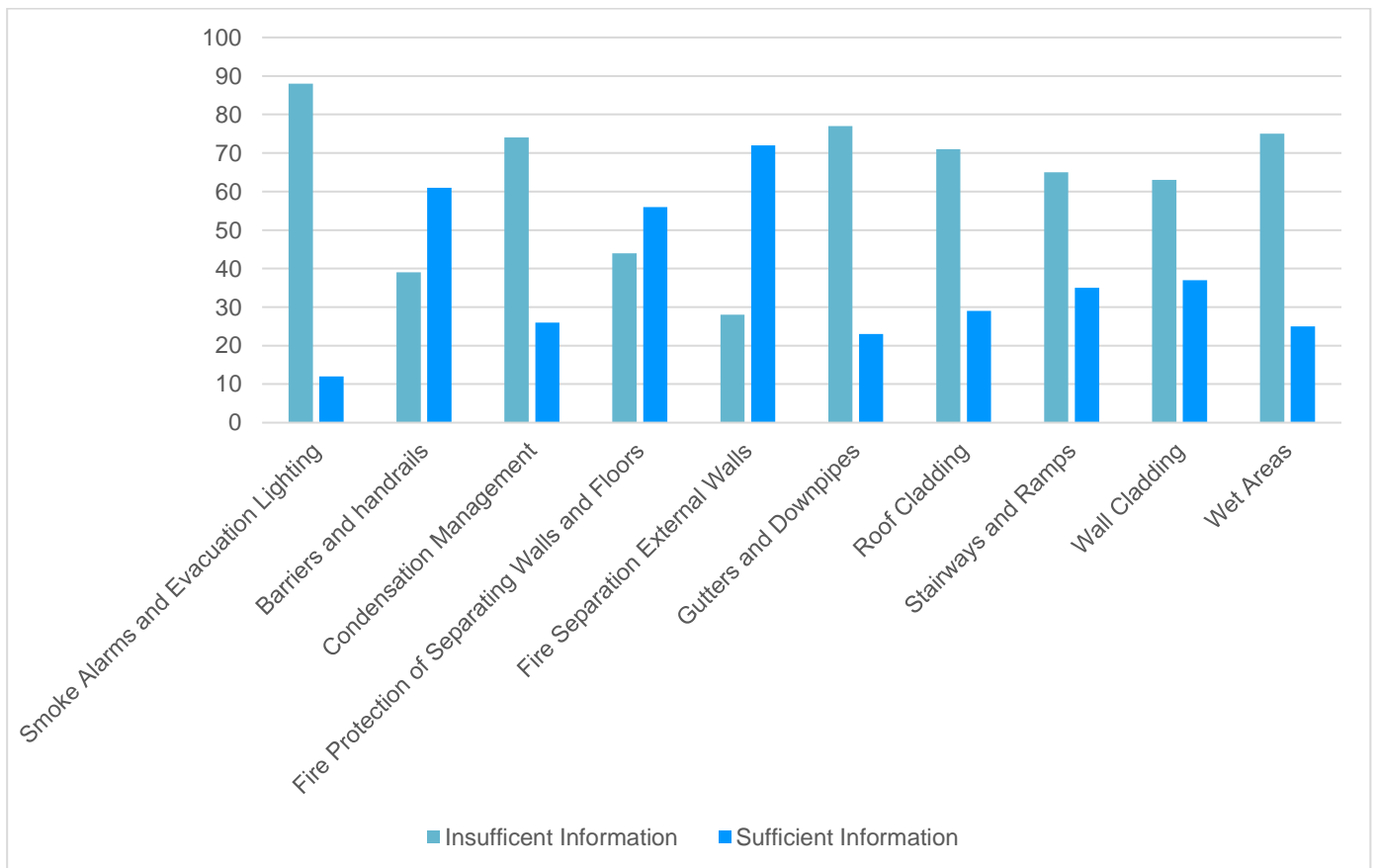


Figure 3. Documentation insufficiencies across all audits, where applicable. Figure 3 is a graph that shows a comparison of sufficient information and insufficient information for each category type.



4. COMPLIANCE INSIGHTS

The compliance levels, that is where compliance had been demonstrated, across all audits are shown in Figure 4.

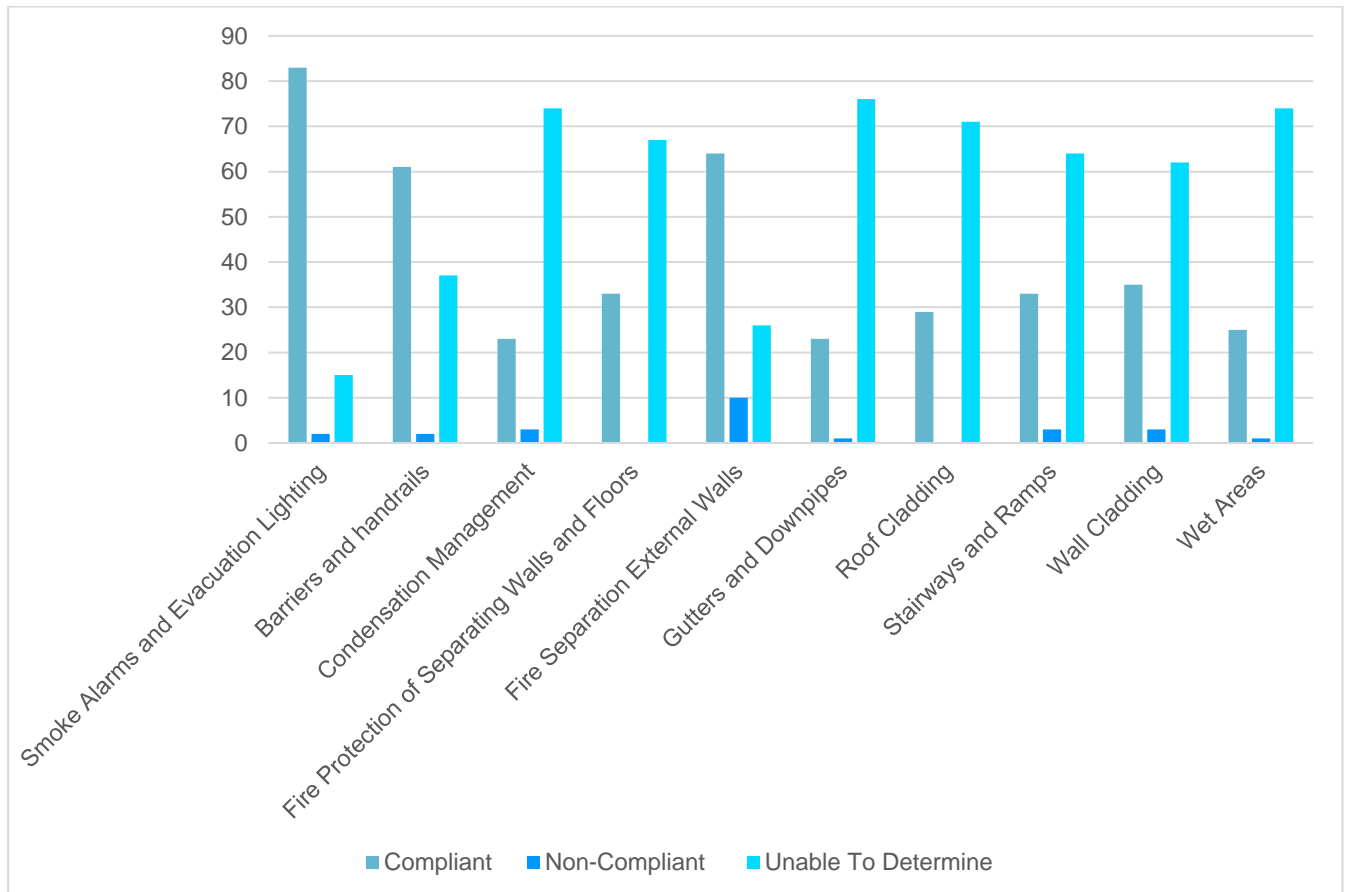


Figure 4. Compliance level across all audits. Figure 4 shows a comparison between the compliance levels of compliant, non-compliant and unable to determine for each category type.



5. SPECIFIC COMPLIANCE INSIGHTS

Structure

Part 2.1 Structure of Volume 2 of the NCC sets out the performance requirements required to be achieved to:

- safeguard people from injury caused by structural failure; and
- safeguard people from loss of amenity caused by structural behaviour; and
- protect other property from physical damage caused by structural failure; and
- safeguard people from injury that may be caused by failure of, or impact with, glazing.

Performance requirement P2.1.1 Structural stability and resistance sets out, among other things, consideration of how a structure is to perform under certain design actions to achieve these objectives.

Where a performance solution is not used performance requirement P2.1.1 can be satisfied by complying with the deemed-to-satisfy requirements of Part 3.0 Structural provisions, Part 3.1 Site preparation Part 3.2 Footings and Slabs, Part 3.3 Masonry, Part 3.4 Framing, Part 3.5 Roof and wall cladding and Part 3.6 Glazing of Volume 2.

Where there are no DTS solutions for non-prescribed wall claddings, such as Expanded Polystyrene cladding, must comply with P2.1.1 via a performance solution.

The audit focused on the footing and slab design.

Part 3.2 Footings and Slabs

DTS clauses 3.2.0 and 3.2.1 inter alia parts 3.2.2 to 3.2.5 were assessed for the proposed footings and slabs as part of the audit to

ensure that performance requirement P2.1.1 had been satisfied where a performance solution was not used.

The majority of footing and slab designs were completed by registered engineering practitioners and certification was provided by the practitioners with a regulation 126 certificate.

Compliance was generally achieved using AS2870 footings and slabs. The audits all had geotechnical investigations with the site classification.

The audits identified the following items for footings and slabs:

- The minimum height of the dwelling floor slab above finished ground level not being specified in accordance with section 5.2 of AS 2870.
- The presence of aggressive soils and the relevant protection requirements as specified in section 5.5 of AS 2870 not being specified.
- The additional drainage requirements for class M, H1, H2 and E sites as detailed in section 5.6 of AS 2870 not specified.
- Evidence of design of screw piles in accordance with AS 2159, where required by the engineer, not being provided.

Non-prescribed wall cladding

Non-prescribed wall claddings, that is cladding materials that there are not DTS provisions for, such as Expanded Polystyrene cladding were assessed to ensure there was a performance solution that demonstrated compliance against P2.1.1.

There were 18 audits that identified a cladding material being used that was not one prescribed in the deem-to-satisfy provisions in Part 3.0 Structural Provisions of the BCA.

These wall solutions were therefore required to have a performance solution to demonstrate compliance with P2.1.1 structural stability.

The majority of the audits had a performance solution that demonstrated compliance through



the use of CodeMark Certificates. It was noted that some audits did not have a regulation 38 determination and that the conditions and limitation on the CodeMark had not been achieved in all audits.

Section 238

Section 238 of the *Building Act 1993* allows a building surveyor to rely on a certificate, issued by another registered building practitioner or endorsed building engineer in a prescribed class, that certifies that the proposed building work complies with the Act and Regulations.

Regulation 126 of the building regulation sets out the form in which a certificate relied upon under section 238 of the Act must be in.

Anomalies in the regulation 126 certificate of compliance for proposed building works could impact the validity of the certificates and their ability to be relied on in good faith by the RBS in accordance with section 238 of the Act.

As part of the audit Certificates of Compliance issued under s.238 and r.126 were assessed for compliance.

Forty three of 49 the audits that had a certificate did not have the certificates in the correct form. This included:

- information missing from the form such as the RBS details, nature of proposed building work details and building classification details.
- design documents specified that were inconsistent with the approved building permit documents.
- standards referenced that were no longer current and that the code or standard the work was certified to was inconsistent with the version nominated on the building permit.
- certificates had a building classification nominated that was inconsistent with the building permit and proposed use of the building.



Damp and Weatherproofing

Part 2.2 Damp and weatherproofing of Volume 2 of the NCC sets out the performance requirements required to be achieved to:

- safeguard occupants from illness or injury and protect buildings from damage caused by surface water, external moisture entering the building and the accumulation of internal moisture in a building; and
- protect other property from damaged caused by redirected surface water.

Performance requirement P2.2.1 rainwater management requires surface water to be managed and disposed of in a way which avoids the likelihood of damage or nuisance to another property, and from not entering the building depending on the average recurrence interval.

Performance requirement P2.2.2 Weatherproofing requires a roof and external wall to prevent the penetration of water that could cause unhealthy or dangerous condition, or the loss of occupant amenity and undue dampness or deterioration of building element.

Performance requirement P2.2.3 rising damp requires moisture from the ground being prevented from causing unhealthy or dangerous condition, or the loss of occupant amenity and undue dampness or deterioration of building element.

Where a performance solution is not used performance requirement P2.2.1 and P2.2.2 can be satisfied by complying with the deemed-to-satisfy requirements of Part 3.5 Roof and Wall cladding of volume 2. While performance requirement P2.2.3 can be satisfied by complying with part 3.2. Footings and slabs.

Part 3.5 Roof and Wall Cladding

DTS clauses 3.5.1.0 to 3.5.1.8 for sheet roofing, 3.5.2.0 to 3.5.2.6 for roof tiles and shingles, Vic variation 3.5.3.0 inter alia AS3500 for gutters and downpipes and 3.5.4.8 for parapet cappings were assessed as part of the audit to ensure that performance requirement P2.2.1 and P2.2.2 had been satisfied where a performance solution was not used.

The audit also assessed non-prescribed wall claddings, that is cladding materials that there are not DTS provisions for, such as Expanded Polystyrene cladding for compliance against P2.2.2.

Part 3.5.1 Sheet Roofing

Compliance for part 3.5.1 Sheet roofing can be demonstrated by complying with the Acceptable Construction Manual (ACM), AS1562.1 or by complying with the Acceptable Construction Practice (ACP) for buildings located in a design wind speed of not more than N3.

There were 17 audits where the ACM was used for sheet roofing. Only one had sufficient information to determine compliance this audit was compliant.

Where the ACM was used there was limited information provided other than a general note for roofing to comply with AS1562.1.

There were 29 audits where the ACP was assumed to be used as there was no reference to the ACM. Of the 29 there were 26 audits with sufficient information to determine that they were all within the parameters of a design wind speed of not more than N3 and deemed to be compliant.

The remaining 3 audits did not have sufficient information to determine the design wind speed.

26 had sufficient information to determine that the minimum roof pitch would be achieved while 13 had sufficient information the maximum span was complied with. Only 2 demonstrated that the corrosion protection requirements of 3.5.1.2 would be achieved.



Compliance in the other audits could not be achieved as the material being used were not nominated and only generic terms or brands were used rather than the specific product.

Details demonstrating compliance with 3.5.1.5 (Fixing of metal sheet roofing), 3.5.1.6 (Installation of roofing sheets), 3.5.1.7 (Flashings and cappings) and 3.5.1.8 (Water discharge) were not identified in any of the approved building permit documents.

Part 3.5.2 Roof tiles and Shingles

Compliance for part 3.5.2 roof tiles and shingles can be demonstrated by complying with the Acceptable Construction Manual (ACM), AS2050 for roof tiling and AS4597 for terracotta, fibre-cement and timber slate and shingles or by complying with the Acceptable Construction Practice (ACP) for buildings located in a design wind speed of not more than N3 and the roof pitch is not less than 15 degrees and not more than 35 degrees using roof tiles that comply with AS2049.

There were 3 audits where the ACM was used and 13 where the ACP was used.

Two audits had sufficient information to determine compliance with the ACP and these were compliant.

General notes were used to nominate compliance to be with the ACP or the ACM however there were no details which showed how compliance would be achieved.

Where tiles were being used these were within the required roof pitch range. However, details on 3.5.2.2 fixing of roof tiles and ancillaries, 3.5.2.3 flashings, 3.5.2.4 sarking requirements, 3.5.2.5 anti-ponding devices and 3.5.2.6 water discharge were not detailed.

Part 3.5.3 Gutters and Downpipes (Vic Variation)

In Victoria, the only DTS solution for compliance with P2.2.1 for gutters is clause 3.5.3.0 which requires compliance with the acceptable construction manual AS/NZS3500.3. Regulation 133 also sets out requirements for storm water drainage.

Regulation 133 Storm Water Drainage

Regulation 133 of the Building Regulations 2018 sets out requirements for storm water drainage. This includes:

- the RBS approving the design of the drainage system to the legal point of discharge.
- Obtaining the report of the relevant council indicating the location of the point of discharge from an allotment either within the allotment or at the allotment boundary.
- Approving the storm water drainage system design.
- Ensuring the that the point of discharge is consistent with the report of the council.

Thirty-two of the audits had the required information and stormwater drainage detailed and approved and were therefore compliant with the regulation including the point of connection being consistent with the reported location for discharge.

Information missing from the remaining audits included:

- No report from the relevant council.
- No details of the storm water drainage,
- No details of how the stormwater drainage was connected to the legal point of discharge.

AS/NZS3500.3 Plumbing and drainage Part 3: Stormwater drainage

Roof plumbing and drainage was identified by industry stakeholders as an area where there are compliance issues. As water ingress is an identified harm through the VBA's regulatory priorities it was included as part of the audit.

The audit focused on Section 2 Materials and Products and Section 3 Roof Drainage Systems—Design of AS/NZS 3500.3 when determining if the gutters and downpipes complied with the NCC. The items considered included:

- Eaves Gutter Systems
- Valley Gutters
- Box Gutters Systems



General findings for Section 2 Materials and Products of AS/NZS 3500.3 included:

- Compliance with clause 2.3.1 roof drainage system components could not be determined in 47 audits as roof drainage system components were not specified to the relevant standards. Components should be specified to compliance with AS/NZS 2179.1 or AS/NZS 2179.2 as required.
- Compliance with clause 2.3.2 Downpipes could not be determined in 47 audits as materials and products were not specified to the relevant standard. Downpipes should be specified to the relevant standard for the material/product.
- Compliance with clause 2.3.3 Accessories and fasteners could not be determined in 47 audits as materials and products were not specified. Accessories and fasteners manufactured from aluminium alloys, aluminium/zinc and aluminium/zinc/magnesium alloy-coated steel, copper, copper alloys, zinc-coated steel, stainless steel and zinc should be specified to AS/NZS 2179.1.

General findings for Section 3 Roof Drainage Systems – Design of AS/NZS 3500.3 included:

- Generally, for eaves gutter systems there was a note that they were to comply with AS/NZS3500.3, however there were:
 - No fall direction, and gradients were only specified in some instances.
 - No details of the cross-sectional area/size of eaves gutters.
 - In some instances, the size and location of downpipes was not specified.
 - No overflow details.
 - higher catchment areas not discharging directly to rain head, sump or spreader.
- Valley Gutters had notes requiring compliance with the standard.

- Where valley gutters identified were identified these were all on roofs which had the required roof slope of not less than 1:4.5 (12.5°).
- There were valley gutters that did not have details of the sizing and effective width.
- Some drawings specify that the design and construction of gutters and downpipes shall comply with the acceptable construction practice of BCA part 3.5.3 which is not applicable in Victoria in accordance with clause 3.5.3.0.
- There were 22 audits which had Box Gutters.
 - 12 were compliant with the general requirements for box gutters in 3.7.1 as they had the overflow requirements nominated.
 - 11 were compliant with 3.7.2 as they showed the freeboard size.
 - 10 were compliant with the limitations of clause 3.7.3 as box gutter gradients, rainhead design flows and downpipe sizes were within the prescribed ranges.
 - 4 showed full compliance with design procedure requirements of clause 3.7.4.
 - 11 had compliant downpipe sizes shown.

Non-compliances with the standard identified in the audits included:

- Box gutters having right angles contrary to 3.7.6 (g) Box Gutter Layout which requires box gutters to be straight (without change in direction).
- Box gutters side discharge contrary to the requirement to discharge at the downstream end without change of direction (i.e. not to the side). The Audits had a hybrid of the sump and rainhead system to discharge on the side, which required a performance solution.
- One box gutter had a 76mm downpipe which is less than the minimum 90mm permitted under clause 3.7.8.



- Catchment area of a valley gutter exceeding 20 m² contrary to the limitation for valley gutters in clause 3.6.1.
- In most instances the rainhead and overflow sizes were not specified.
- Rainhead design showed it covered and not open as per fig 3.7.3. Covered rainheads are not in the scope of AS3500.3.
- No details of system for draining balconies and terrace areas clause 3.8.
- Audits that nominated the use of slotted gutters (overflows) which are not permitted in AS3500.3, only in the ACP.
- A performance solution was not identified for any of the non-compliances with AS/NZS 3500.3.

3.5.4.8 Parapet cappings

Clause 3.5.4.8 of the NCC volume 2 requires wall cladding that is used to form a parapet wall to be attached to the supporting structure and have a capping installed.

There were 14 audits that had parapet walls that would require capping. Only one had sufficient information to determine compliance and it was compliant with the provisions.

The remaining 13 did not have details of how the capping would comply including:

- no details of the material.
- That the capping extended not less than 50mm down the sides of the parapet.
- That the top of the capping sloped a minimum of 5 degrees.
- How the joint in the capping would be constructed.

Non-prescribed Wall cladding

During the State-wide Cladding Audit on Class 2 to 9 buildings issues with weatherproofing external walls was identified. This included water ingress allowing for mould formation and rotting of timber framing. As part of the audit a focus was put on the weatherproofing of non-prescribed wall cladding such as expanded polystyrene.

There were 18 audits that identified a cladding material being used that was not one prescribed in the deem-to-satisfy provisions in Part 3.5.4, Part 3.3 or Part 3.5.5 of the BCA.

These wall solutions were therefore required to have a performance solution to demonstrate compliance with P2.2.2 weatherproofing.

The majority of the audits had performance solution that demonstrated compliance through the use of CodeMark Certificates. It was noted that there were audits that:

- Did not have a regulation 38 determination.
- Did not meet the conditions and limitation on the CodeMark.
- had CodeMark certificates for a version of the NCC that was not consistent the building permit nominated.
- had inconsistencies of the approved cladding type on the working and structural drawings.

P2.2.1 Weatherproofing

Whilst weatherproofing was not generally in the scope of the audits for prescribed cladding materials. It was identified in some audits that weatherproofing P2.2.2 of the 10a when associated with class 1a had not been considered where there was not a stepdown between the dwelling and the garage.



Fire Safety

Part 2.3 Fire safety of Volume 2 of the NCC sets out the performance requirements required to be achieved to:

- safeguard occupants from illness or injury by alerting them of a fire in a building so that they may safely evacuate; and
- avoid the spread of fire.

Performance requirement P2.3.1 Spread of fire requires Class 1 buildings to be protected from the spread of fire from another building, other than an associated class 10, and an allotment boundary, other than a boundary adjoining a road or public space.

Performance requirement P2.3.2 Automatic warning for occupants requires occupants of a Class 1 building to be provided with an automatic warning on the detection of smoke so that they can evacuate safely in the event of a fire.

Where a performance solution is not used performance requirement P2.3.1 and P2.3.2 can be satisfied by complying with the deemed-to-satisfy requirements of Part 3.7 Fire safety of volume 2.

Part 3.7 Fire Safety

DTS clauses 3.7.2.2 to 3.7.2.7 for fire separation of external walls, 3.7.3.2 to 3.7.3.5 for fire separation of separating walls and floors, 3.7.4.2 and 3.7.4.3 for protection of garage top dwellings, and 3.7.5.2 and 3.7.5.3 smoke alarms and evacuation lighting were assessed as part of the audit to ensure that performance requirement P2.3.1 and P2.3.2 had been satisfied where a performance solution was not used.

Part 3.7.2 Fire separation of external walls

Seventeen audits had an external wall that was less than 900mm from the allotment boundary or 1.8m from another building on the same allotment.

- 10 of these had sufficient information to determine compliance.

- Nine audits had nominated that the wall required an FRL.
- One audit was non-compliant.

Thirty-eight of the audits had a class 10a building located between the boundary and the dwelling or another dwelling on the same allotment.

- 35 had sufficient information to determine compliance, that is the setback was nominated.
- 34 were compliant.
- There were two that were non-compliant.

Construction of external walls required to achieve an FRL was primarily achieved through the use of brick construction.

Information not identified in most the audits included:

- Details showing that the wall extended to the underside of the non-combustible roof covering or terminating not more than 200 mm from the underside of the non-combustible roof covering where the area between the external wall and roof covering is sealed with a non-combustible fascia, gutter or flashing.
- Evidence of suitability in accordance with part A of the BCA to demonstrate the external wall achieved the required FRL when tested from the outside.

A non-compliance with the DTS provisions, where no performance solution existed, related to the separation of multiple units on the same allotment. Each unit was two storeys, and the second storey was a class 1a part that's floor was supported by an open carport. Whilst the second storey external walls had the required separation, the ground storey carports did not have the required separation. Whilst the carport was open on two sides and not less than one third of the permitter was open it was providing direct vertical support to part of the Class 1a building. Consequently, the RBS issued a building notice and compliance was determined through a fire engineering solution.



A non-compliance arose where the wall did not extend to the underside of a non-combustible roof covering.

A non-compliance arose where the first-floor external wall required to have an FRL did not commence at the footings or ground slab, and therefore required a performance solution.

There were 28 audits which had encroachments i.e., eaves within 900 mm of an allotment boundary or within 1.8 m of another building on the same allotment.

- 24 had sufficient information to determine compliance.
- 20 were compliant.

The four non-compliant audits were the result of:

- Down pipe material not non-combustible.
- Eaves within 450mm of the allotment boundary when only permitted to be located within 900mm but not less than 450mm.
- Timber fascia instead of non-combustible fascia.

Part 3.7.3 Fire protection of separating walls and floors

There were eight audits that had separating walls. Of these eight audits:

- Two had sufficient information to determine compliance. These two audits were compliant.
- Six audits did not have sufficient information to determine compliance.

Missing information included:

- Details showing that the wall would extend to the underside of a non-combustible roof covering.
- That where a tested system was nominated that there was evidence that the system complied with Part A of the BCA evidence of suitability requirements.
- Details showing compliance with tested system manufacturer requirements.

Part 3.7.4 Smoke alarm and evacuation lighting

All audits required a smoke alarm.

The majority of the audits had notes that the smoke alarms were to be installed to AS3786, in some instances information missing included:

- that the smoke alarms are to be interconnected
- that they are to be hardwired to consumer mains.



Health and Amenity

Part 2.4 Health and amenity of Volume 2 of the NCC sets out the performance requirements required to be achieved to:

- safeguard occupants from illness and injury and protect the building from damage caused by the accumulation of internal moisture arising from the use of wet areas in the building; and
- safeguard occupants from illness and injury due to lack of air freshness.

Performance requirement P2.4.1 Wet areas requires the building's structure and occupant's amenity to be protected by preventing water penetrating behind fittings and linings or into concealed spaces of sanitary facilities, bathrooms, laundries, and the like.

Performance requirement P2.4.7 condensation and vapour management requires the risk associated with water vapour and condensation be managed to minimise their impact on the health of occupant.

Where a performance solution is not used performance requirement P2.4.1 and P2.4.7 can be satisfied by complying with the deemed-to-satisfy requirements of Part 3.8 health and amenity of volume 2.

Part 3.8.1 Wet Areas

DTS clause 3.8.1.2 was assessed as part of the audit to ensure that performance requirement P2.4.1 had been satisfied where a performance solution was not used.

3.8.1.2 Wet Areas - Shower

14 audits had sufficient information to determine compliance for the wet areas in the shower area, one of which was non-compliant. The non-compliance arose from the waterproofing membrane not extending into the floor strip drain.

The compliant audits had:

- Wet area to be as per AS3740-2010 nominated in General Notes and location of wet areas shown on the plans.

- Shower base details and installation, and waterproofing details shown on the plans.

Missing information to determine compliance with this clause included:

- No details of where and what type of waterproofing system required, only a general note to be in accordance with AS3740.
- No waterproofing details for wall joints and wall/floor junctions.
- No details of how penetrations are waterproofed.

3.8.1.2 Wet Areas - Outside Shower Area

16 audits had sufficient information to determine compliance for wet areas outside of the showers. These compliant audits had:

- The locations required to be waterproofed or water resistant were nominated.
- Details of the flooring material that showed whether they were required to be water resistant or waterproof. Where required to be waterproofed there was details of waterproofing system.
- The area of wall the waterproofing/water resistance was required to be applied.

Those audits where there was insufficient information to determine compliance included:

- only general notes to comply with AS3740 and no details of where compliance was required and what was required.
- No details of how wall/floor junctions would be waterproofed.
- Where the waterproofing/water resistance was required.

3.8.1.2 Wet Areas - Adjacent Spa and Bath

There were 47 audits that had a wet area adjacent to a spa/bath. 8 of these had sufficient information to determine compliance, all of which were compliant.



Those where compliance could not be determined because there was insufficient information did not:

- detail whether water resistance or water proofing was required and the location it was required in.
- Detail how junctions would be water resistant/waterproofed.
- Detail how penetrations would be waterproofed.

3.8.1.2 Wet Areas - Other

There were 11 audits that had sufficient information to determine compliance for other wet areas such as laundry floors and walls adjoining other vessels such as the laundry tub or basins. These 11 were compliant and showed the location of the water resistance including the wall above vessels.

Those where compliance could not be determined because there was insufficient information:

- Did not detail where water resistance was required including the wall above vessels.
- That the junctions would be water resistant.
- That penetrations for taps and spouts would be waterproofed.

Part 3.8.7 Condensation Management

DTS clauses 3.8.7.2 to 3.8.7.4 were assessed as part of the audit to ensure that performance requirement P2.4.7 had been satisfied where a performance solution was not used.

These condensation management provisions were introduced in NCC 2019.

3.8.7.2 Pliable building membrane

There were 48 audits which had pliable building membranes specified.

Five audits had sufficient information to determine compliance. Four of which were compliant.

One audit had a vapour barrier nominated rather than a vapour permeable membrane

that is required for climate zones 6, 7 and 8 and was therefore non-compliant.

Those where there was insufficient information to determine compliance only had a note for the membrane to comply with AS/NZS 4200. There were no details of the membrane to be used and evidence of suitability to demonstrate compliance with AS/NZS 4200.1 and vapour permeability requirements.

3.8.7.3 Flow rate and discharge of exhaust systems

There were 23 audits that had sufficient information to determine compliance. This included:

- notes on the required flow rate.
- That it was required to be discharged to external or vented roof space.
- There were two audits that were non-compliant. The non-compliance arose from the exhaust flow rate being nominated as 25L/s rather than 40L/s for kitchen exhausts.

Missing information to determine compliance included:

- Discharge to outside air being nominated but not the required flow rate.
- Flow rate nominated but no details on whether it was to outside air or ventilated roof space.

3.8.7.4 Ventilation of roof spaces

There were 16 audits that had exhaust systems discharging into the roof space.

Only one audit had sufficient information to determine compliance. This audit was compliant.

The remaining audits did not have details of the size and distribution of the vents therefore it was not possible to determine that the roof would have adequate ventilation.



Safe movement and access

Part 2.5 Safe movement and access of Volume 2 of the NCC sets out the performance requirements required to be achieved to provide people with safe access and movement within a building.

Performance requirement P2.5.1 Movement to and within a building requires safe walking gradients, and stair and ramp elements to meet certain requirements.

Performance requirement P2.5.2 Fall prevention barriers sets out circumstances in which barriers are required to prevent falls.

Where a performance solution is not used performance requirement P2.5.1 and P2.5.2 can be satisfied by complying with the deemed-to-satisfy requirements of Part 3.9 Safe Movement and Access of volume 2.

Part 3.9.1 Stairways and ramp construction

DTS clauses 3.9.1.2 to 3.9.1.6 were assessed as part of the audit to ensure that performance requirement P2.5.1 had been satisfied where a performance solution was not used.

3.9.1.2 Stairway construction

Thirty-four of the audits had stairs that were required to comply with P2.5.1.

- One of the audits had sufficient information to determine compliance.
- 33 audits did not have sufficient information to determine compliance.
- The audit that had sufficient information to determine compliance was compliant.
- Those that did not have sufficient information mainly had generic notes for the stairs to comply with BCA 3.9.1.2. This mainly included the maximum number of risers permitted, minimum and maximum riser height, going and slope relationship, and maximum opening between risers.
- There were no details to demonstrate that the stairs had been designed to

take loading in accordance with AS1170.1.

The level of detail identified on the plans would result in the person on site having to determine what is required to comply.

3.9.1.4 Slip-resistance

Thirty-four of the audits had stairs that were required to comply with P2.5.1.

- Four of the audits had sufficient information to determine compliance.
- These four audits were compliant.
- The remaining audits did not have sufficient information to determine compliance.
- The majority had general notes for the slip resistance to comply with 3.9.1.4.
- The level of details in the notes varied from comply with table 3.9.1.3 of NCC to those that nominated the required slip resistance rating.
- Those audits with insufficient information did not specify product details and provide evidence of suitability to demonstrate that the product achieved the required slip-resistance classification when tested in accordance with AS 4586, however did have general notes that the slip resistance was to comply with AS4586.

3.9.1.5 Landings

In the audits that required landings:

- there were general notes that the landings were to comply with the NCC.
- Whilst the landing dimension wasn't always detailed it was possible to determine from the plans that the minimum required landing could be achieved.

3.9.1.6 Thresholds

The audits identified:

- That the doorways having thresholds were mainly on external doors and internal doors on garages.
- Internal doors between garages and the dwelling area had sufficient detail of the step down to show compliance.



- External doors generally had sufficient detail to determine that the threshold would comply however there were audits where the external surface level was not nominated and therefore when scaled from the plans would exceed the maximum threshold height.

Part 3.9.2 Barriers and Handrails

DTS clauses 3.9.2.2 to 3.9.2.5 were assessed as part of the audit to ensure that performance requirement P2.5.1 and P2.5.2 had been satisfied where a performance solution was not used.

3.9.2.2 Barriers to prevent falls

There were 20 audits that required barriers to prevent falls. Of the 20 audits:

- 20 had sufficient information to determine that there would be a barrier required.

3.9.2.3 Construction of barriers to prevent falls

There were 20 audits that required barriers to prevent falls to be constructed in accordance with 3.9.2.3

- One had sufficient information to determine that the barrier would comply with 3.9.2.3
- The majority had the required height nominated.
- There was one audit where a barrier was not nominated on the landing more than 1m above the surface beneath.

Missing information from the documentation included:

- Construction details and the materials being used.
- Details of the gaps and that they do not exceed 125mm.
- That the barrier was designed to take the loading forces in accordance with AS/NZS 1170.1.

3.9.2.4 Handrails

There were 20 audits where the handrails were required to be installed on stairways.

- 18 had sufficient information to determine that the handrail was required.
- These 18 audits were compliant.
- There were two audits where there was insufficient detail to show that the handrail would comply. This included one audit where it was only conditioned that a handrail was required and there was no details of the height and location.



6. GENERAL OBSERVATIONS

As identified in previous audits for other classifications, there was a high reliance on general notes on plans rather than specific details of what was required to achieve compliance.

An observed consequence of the use of general notes and details on drawings is inconsistency between drawings, which can create confusion, and the inclusion of irrelevant details. For example, one drawing specified exhaust systems shall discharge to outside air or a ventilated roof space, and another specified discharge to outside air. Another example was the inclusion of waterproofing details for a shower over a bath which were not relevant to the dwelling.

Issues identified by industry stakeholders as areas where difficulties arose on site, such as roof drainage, were validated as areas that the plans lacked sufficient information to determine compliance. For example, a common overflow device at the downstream end of box gutters shown on drawings is a sump with a side duct to a rain head with a downpipe and overflow provision. This overflow device arrangement is not in accordance with figure 3.7.3 of AS/NZS 3500.3 and therefore requires a performance solution. A performance solution for this alternative arrangement was not identified in any of the audits.

Generally, the roof design is not being considered which is contributing to the overall issues with the roof drainage. Based on the audit observations and the feedback from industry a conclusion that can be drawn is that poor detailing on the plans is creating onsite difficulties.

Other common trends observed during the audit included:

- Reliance by the RBS on certificates or statements of compliance issued at the end of the project to be satisfied that the building work will comply. This particularly relates to roof plumbing and waterproofing works. This contradicts the requirements of section 24 of the *Building Act 1993* for the RBS to be satisfied of compliance of the building work when issuing the building permit.
- There appears to be some misunderstanding of the application of acceptable construction manuals and acceptable construction practices in the BCA with drawings specifying compliance with both. As specified in clause A2.3 of the BCA, when an acceptable construction manual or acceptable construction practice in the same part satisfy the same performance requirement, it is only necessary to satisfy one of these.



7. POST-AUDIT ACTIONS

As part of the audit where non-compliances were identified or there were items where there was insufficient information in the plans and documentation to determine whether compliance was achieved, the RBS was notified and where the item posed a high risk required to provide a response to the VBA.

Where RBSs were required to provide a response to items identified by the VBA in the audit, RBSs were generally responsive and able to provide the required information, including evidence of suitability.

There were some occasions where the RBS had to take enforcement action to achieve compliance including the issuance of building notices. There were items where performance solutions were required to confirm that compliance had been achieved.

In some instances, initial responses from the RBS did not demonstrate that compliance have been achieved. This included that the information provided was not evidence of suitability in accordance with the governing requirements. For example, manufacturers brochures were provided for fire resistance levels rather than the required test reports.

There were also responses that demonstrated there is a misunderstanding about the roles of different practitioners. This included where issues were identified on the plans with plumbing work, such as box gutters with right angles or roof drainage not detailed, and building surveyors were relying on plumbers to install and/or correct this on site.

8. AUDIT CHALLENGES

Consistent with the previous audit report, 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.

Furthermore, the VBA is not a central repository of information, therefore there is a reliance on all information being provided to council by the RBS and then this information being provided to the VBA. This could be overcome by regulatory reform requiring the VBA being a central repository of information.



Further Resources

Want to know more?

If you have any questions about this information, please contact the VBA.

Telephone: 1300 815 127

Email: customerservice@vba.vic.gov.au

Victorian Building Authority

733 Bourke Street, Docklands VIC 3008

vba.vic.gov.au