

# Water ingress in buildings: Balconies, roofs and drainage (Research insights)

The following answers have been provided to questions asked during the Water ingress in buildings: Balconies, roofs and drainage (Research insights) on 24 October 2024.

The answers provided are correct as of **12 November 2024**.

## Glossary

- Annual Exceedance Probability (AEP)
- Average Recurrence Interval (ARI)
- Architects Registration Board of Victoria (ARBV)
- Australian Building Codes Board (ABCB)
- Australian Institute of Architects (AIA)
- *Building Act 1993* (Building Act)
- Building Code of Australia (BCA)
- Building Regulations 2018 (Building Regulations)
- Deemed to Satisfy (DTS)
- Department of Transport and Planning (DTP)
- Direction to Fix (DtF)
- Domestic Building Dispute Resolution Victoria (DBDRV).
- Domestic building insurance (DBI)
- Fibre cement (FC)
- Guide to Standards and Tolerances (GTST)
- Municipal Building Surveyor (MBS)
- National Construction Code (NCC)
- Plumbing Regulations 2018 (Plumbing Regulations)
- Relevant building surveyor (RBS)
- Victorian Managed Insurance Authority (VMIA)

## Q&A

### Where can I find a copy of the presentation slides?

A copy of the presentation slides and recording of the webinar are available on the [VBA website](#).

### Could you please tell us about some standard details for balconies (concrete & timber) and any recommended system (e.g. brand & products)?

Key Australian Standards for balcony construction include AS 1170 for structural design, AS 3600 for concrete structures, AS 1684 for timber-framed balconies and AS 1720 for timber design. AS 4654 covers waterproofing, while AS 3700 applies to masonry elements. For balconies in bushfire-prone areas, AS 3959 provides guidance, and termite management is covered by AS 3660. Additional standards like AS/NZS 3500 for drainage and AS 1170.4 for seismic design may also be relevant



depending on the structure's location and use. For further information, please see our safety guide on [balconies, decks and balustrades](#).

The Victorian Building Authority (VBA) provides general advice in relation to the application of building and plumbing standards. As the regulator, we do not recommend specific systems, brands or products. For a more tailored assessment and to ensure suitability for your project, it is recommended to consult a qualified professional who can provide detailed guidance based on your specific requirements.

**Please clarify further requirements/ drawings needed for compliance. What is the level of details you would like to see on the design drawings in relation waterproofing?**

**What level of documentation should be expected from the practitioners to provide at Building Permit stage? Quite often, we will only get a notation on the drawings, or a section with minimal information.**

**What is the minimum level of documentation required to demonstrate compliance with the relevant National Construction Code (NCC) or Building Code of Australia (BCA) and relevant Australian Standard AS4654.2?**

**Often designers will reference manufacturers specifications and details rather than document these. Are these documents reliable?**

The level of detail and information in drawings should be sufficient for a relevant building surveyor (RBS) to be able to determine compliance of the material, product, design, form of construction etc, against specific NCC or Australian Standard requirements. This level of detail must also show how the building (or part of the building) will be constructed. The level of detailing in the NCC and Australian Standards is typically sufficient to demonstrate compliance, however holistic design considerations should be applied. Factors such as building design complexity, type of materials, different types of junctions, connections, articulations that require additional detailing and documentation to demonstrate compliance.

Compliance information, such as test certificates and reports provided for products, materials, designs and forms of construction, must satisfy the evidence of suitability requirements in Part A5 of the NCC. To assist practitioners, the VBA has provided a [Guide for Design Documentation for Class 2 buildings](#). This provides further details on documentation and information sufficiency and can generally apply across different building types.

**Can pliable membranes achieve an appropriate level of waterproofing over the life expectancy of a building? Should we re-introduce waterproofing inspections as a mandatory notification stage?**

"Pliable building membrane" is a defined term in the NCC 2019 onwards. Pliable building membranes (PBM) will have to be taped, and warranties for membranes and tapes are not known to be for the life expectancy of the building. Please note, PBMs are intended as a secondary protection behind the facade material as part of the overall wall system.

Waterproofing issues have been a significant concern in Victoria, prompting ongoing discussions about reforming building regulations and related legislation. Efforts to address these issues include the Expert Panel's Stage One report, which recommends mandatory inspections of wet area construction for Class 2 buildings (Recommendation 14B). We understand that the Department of Transport and Planning (DTP) is actively working to develop reforms to implement this recommendation. The VBA is also committed to enhancing guidelines and compliance measures to reduce waterproofing failures. Given the persistence of these issues, building regulations will likely continue to evolve to improve waterproofing standards and practices.



### **Are traditional concealed gutter houses legal/certifiable, or what is required to make them 'Deemed to Satisfy (DtS)'?**

Concealed gutters must comply with the NCC's provisions for stormwater drainage and roof drainage to prevent water ingress and structural damage. Key DtS requirements include:

- Compliance with *AS/NZS 3500.3: Plumbing and Drainage - Stormwater Drainage*, which specifies proper sizing, slope and overflow provisions
- Adequate overflow measures must be provided to avoid water backing up into the roof space
- Materials used must meet durability and corrosion resistance standards.

If concealed gutters do not meet these requirements, they may require additional performance-based assessments to ensure compliance. Please note that this is general advice. For a more tailored assessment and to ensure suitability for your project, consult a qualified professional who can provide detailed guidance based on your specific requirements.

### **What is the minimum size for a capping on a parapet wall in cyclonic winds to stop upward wind and rain penetration?**

At a minimum, the Australian Building Codes Board's (ABCB) Housing Provision *Clause 7.5.8* provides that cappings must extend a minimum of 50 mm down the sides of the parapet, however this clause does not specify a minimum size relative to cyclonic wind regions. We suggest you consult to a weatherproofing professional for consideration of cyclonic wind region requirements.

### **Could you please explain about the location of key services (i.e. electrical switchboards) in vulnerable areas to water ingress?**

While the NCC does not provide specific requirements for electrical switchboards boxes or similar features on external walls, compliance with *H2P2 weatherproofing* is still required. We suggest speaking to the building designer to ensure that the detail around these features meets the performance required. Part 2 of the [webinar](#) shared different design techniques that could be used to ensure compliance with the weatherproofing requirements.

### **As drainage and waterproofing plays a major role in whether leaks occur in a balcony or a roof, what details need to be highlighted in the design process be improved to try and mitigate error on site?**

Waterproofing needs to be designed as a system - from the substrate to the finished floor. This means ensuring the substrate is compliant (design and construction), surface preparation has been completed well and falls are designed and constructed as required. In terms of drawings details, one should ensure that junctions, such as at hobs, drains, floor to ext. wall, balustrade connection, penetrations (such as downpipes) and door thresholds, amongst others, are detailed and compliant with the relevant requirements. Research has identified these areas as prone to failure and at risk of water ingress.

Drainage is typically required to comply with *AS3500.3* or *Part 3.3 of the Housing provisions*. Following the steps and detail in this Standard provides assurance of a compliant design.

It is also important to note that installation of products and poor workmanships also resulted in water ingress. Ensuring works are completed in a compliant manner plays a critical role to support a good design, for roofs, balconies and with drainage.

For guidance on design documentation details, please refer to the VBA's recently issued [Design Documentation Practice Guide for Class 2 buildings](#).



**Could you please give examples of flashings to different window openings/materials i.e. what we should accept as a minimum standard with Polystyrene cladding, commercial aluminium window sections, etc?**

Flashings must meet *AS/NZS 4284*, using flexible or metal flashings to ensure weatherproofing. Commercial aluminium windows, head, sill and jamb flashings are required to comply with *AS 2047*. Materials should meet *AS/NZS 2904*, with proper laps and UV/weather-resistant seals.

Please note that this is general advice. For a more tailored assessment and to ensure suitability for your project, consult a qualified professional who can provide detailed guidance based on your specific requirements.

**To what extent are the drawings required to depict compliance, as this is something that we do not even inspect? What are we looking for at the final inspection?**

Documentation drawing details should demonstrate compliance with the NCC, *Building Act 1993* and Regulations, such that an RBS can determine compliance. However, the purpose of design documentation extends beyond demonstrating compliance, it also includes demonstrating how the proposed work will be constructed and how different parts, materials, components and systems are installed. This ensures that the design is built to comply.

For details of what to look for when conducting a final inspection, refer to the following Practice Note – [Building Practice Note BP-09: Issuing of an Occupancy Permit](#).

**What is the best design detailing for water proofing?**

Examples of compliant waterproofing designs are found in *AS 4654.2 Waterproofing membranes for above ground use - Part 2: Design and installation* and *AS3740 Waterproofing of wet areas within residential buildings*.

For best practice designs, we encourage engaging a waterproofing consultant and/a design practitioner with the relevant expertise for specific designs.

**I seek diagrams of balcony handrail stanchion fixing through the waterproof membrane (if allowed and compliant) and what building regulation is applicable?**

Details for compliant waterproofing incorporating balustrades can be found in *AS 4654.2 Waterproofing membranes for above ground use - Part 2: Design and installation* under *Clause 2.8.4*. Please also review part 1 of the [webinar](#) for additional relevant content.

**Can you please step through the design risk factors for condensation issues in eaves a) under balconies, b) under flat roofs?**

**Can you also comment on design risk factors and provide some statistics for balconies - for example - Fall, Materials, Waterproofing Method, Articulation, etc?**

We recently conducted a webinar, "[Research Insights: Management of Condensation and Mould Growth Risk](#)," which explored how to mitigate condensation and mould growth risks through research insights and measures in the NCC.

Causes or risk factors for balconies include:

1. Poor design documentation, including lack of details in the documentation
2. Design choices which may complicate weatherproofing and affect watertightness
3. An unclear chain of responsibility and accountability for design and installation of waterproofing
4. Lack of understanding and misinterpretations of waterproofing requirements among practitioners
5. Poor coordination and collaboration between building practitioners during design stages.



More information about risk factors for balconies can be found in our research reports available [by visiting the research page on the VBA website](#).

### **How durable is the use of compressive sheets in balconies?**

Compressed fibre cement (FC) sheets manufactured in accordance with AS2908.2 can be a durable option for balconies, offering potential resistance to impact, moisture, weather and pests. However, their long-term performance depends heavily on correct installation, waterproofing and maintenance. In specific environments, such as coastal areas, extra care may be needed. For a more tailored assessment and to ensure the suitability for your project, it is recommended to consult a qualified professional who can provide detailed guidance based on your specific requirements.

### **What's the best tanking paint and pedestal tiles?**

The VBA provides general advice in relation to the application of building and plumbing standards. As the regulator, we do not recommend specific systems, brands or products. For a more tailored assessment and to ensure suitability for your project, it is recommended to consult a qualified professional who can provide detailed guidance based on your specific requirements.

### **Why is the water stop higher than most tile finishes i.e., water stop minimum 15mm and a tile with glue is 8-12mm?**

The position of the waterstop is determined by the design of the shower, whether it's enclosed or unenclosed, hob or hobless, stepdown or not. For a level threshold between tile and waterstop, see requirements that need to be satisfied under *Clause 10.2.17 of the ABCB Housing provisions*.

### **Does the Australian Standards differ to the NCC with water proofing?**

NCC provides broad, performance-based and detailed technical requirements for the design construction and performance of buildings in Australia. Where the technical details are not within the NCC, the Code references specific technical standards.

Australian Standard AS 4654.2 is referenced in both NCC Volume One and Two, provides DtS external waterproofing requirements under *F1D4* and *F1D5* and provides designers, builders, water proofers and manufacturers with the requirements for the design and installation of external waterproofing membrane systems applied to roofs, decks, balconies and planter boxes in buildings.

### **What are the best practices to install and waterproofing leak control flanges?**

Depending on the use, application and type of flange, we suggest referring to AS4654.2 (or AS3740) for the minimum requirements of the design and installation for your specific design. This is in addition to the manufacture installation requirements for both the flange and waterproofing material.

### **Please clarify/discuss the different instances where there is a requirement for a minimum 25mm set-down, as opposed to the 1500mm waterstop required for an unenclosed shower, and considering 10.2.24 for whole bathroom waterproofing. Would we not just do whole-of-bathroom waterproofing to the floor, who do you want to see all three approaches integrated into a bathroom's water-proofing?**

Compliance with the NCC will depend on the proposed design, as the purpose of the NCC is to offer flexibility in achieving compliance. *H2D2* and *H2D3* gives the DtS requirements for wet areas, which reference AS3740 and *Part 10.2 of the housing provisions*.

### **What is the best practice for a waterproof balcony?**

Depending on the design of the balcony, multiple factors need to be considered to determine the best waterproofing system for your specific design. We refer you to AS4654.2, which provides the minimum details required to comply with waterproofing for balconies. You may need to consider speaking to a building designer or waterproofing consultant for more specific advice.

**What size overflow do you need for an unroofed balcony?****How do you calculate the size of drains and overflow provisions?****Shed some light on Balcony Overflow & Drainage Design for Compliance and Best Practice?**

Clause 3.8 AS/NZS3500.3 *Stormwater Drainage* requires systems for draining balconies and terraces to be designed for 5% AEP (20-years ARI) rainfall intensity and 1% AEP (100-years ARI) rainfall intensity for overflows.

There is no prescribed method for the sizing of the balcony drainage, although the note to *Standards Australia Handbook - SA HB 39* states the general design and sizing principles of roof drainage systems (AS/NZS3500.3) may be also utilised when installing drainage outlets, downpipes and overflow provisions in the above ground external areas of buildings, such as drains from balconies, patios and the like.

**What is the typical size of a lear gutter as opposed to a box gutter?**

AS/NZS 3500.3 provides the detail for designing a box gutter using the DtS pathway under the NCC. Care should be taken in using a lear gutter to ensure they still comply with the NCC, as in some instances (e.g. a V gutter in lieu of a box gutter) it would not be a compliant DtS solution.

**What is the correct application of water proofing membrane to be applied at the interface of any balcony and external wall frame and what is considered an approved membrane?**

AS4654.1 and AS4654.2 provides the technical compliance details for balcony and external wall junctions, however it is best to consult with the building designer and manufacturer specifications on matters that relate specific construction designs.

Approved membranes are waterproofing membranes that are fit for purpose and deemed compliant with the NCC and Australian Standards, as part of the waterproofing system approved by the RBS as part of the permit approval process.

**When using Scyon or other CFC material as a base flooring material is there a requirement for the supporting floor frame to be of a durable species as per the Scyon installation manual?****When rectifying a balcony that has mould evident in the timber structural elements, is it acceptable to treat the mould or do the affected structural elements require replacement?**

The structural durability of the timber frame should be considered as part of the design, however the relevant standards may not be explicit in stating a particular durability class. Manufacturer's information may be beneficial in deciding but does not alter NCC compliance.

A structural assessment must be undertaken to ensure the framing timber will still perform as intended (i.e. no decay or deterioration in structural capacity). You may wish to speak to a mould expert to determine appropriateness of treating mould.

**In AS 4654.2 a minimum of 1:100 fall is required for the finish surface.****One method to reduce issues with water entering building is to shed water from the high point to the lowest point for dispersion of water.****Complying with AS 4654 .2 means the waterproofing can be applied to a horizontal substrate providing the finish has a minimum of 1:100 fall.****Do you believe having the fall on the substrate compulsory for all deck or balconies that require waterproofing would be an advantage over the existing standard requirement of 1:100 minimum fall on the final finish?**

NCC 2025 public comment draft has a range of changes proposed to NCC Volume 1, including improvements to waterproofing and water shedding provisions. New DtS provisions proposed for NCC 2025 include grading to the structural substrate. Further information can be found on the [ABCB website](#), including the benefits of shedding water using grading to the structural substrate.



**Should a registered inspector review and confirm compliance with the plumbing code (BCA volume 3)?**

**How do building surveyors deal with performance solutions from plumbers (Roofing / Stormwater drainage). Should the process be treated the same as in volume 1 and 2 in relation to the RBS functions?**

This largely depends on the circumstances. In general, an RBS can rely on a compliance certificate issued by a licensed plumber certifying that the plumbing work complies with the *Plumbing Code (Vol 3)* and Plumbing Regulations.

However, the RBS must assess performance solutions provided by plumbers, including for roofing or stormwater drainage, with a similar rigor as applied to *Volumes 1 and 2 of the BCA*. The process should ensure that the proposed solution meets the performance requirements.

The VBA has educational and material on using a performance solution for plumbing work and the role of the RBS in the process. Please review the videos provided by [visiting the VBA website](#).

**Is performance solution required for balcony acting as roof or as per NCC2022 compliance with AS 4654.1-2 meet the requirement?**

**What details must be provided on arch drawing in order show compliance & what types of certifications should be provided by builder for balcony's waterproofing at the completion of project?**

Performance solutions are designed for a specific purpose and building (or part) satisfying specific requirements (outside of DtS). While there are commonalities between the purpose of a balcony acting as a roof and a balcony complying with *AS4654.1-2*, compliance comparisons cannot be made without details of the specific performance solution.

For guidance on design documentation details, please refer to the VBA's recently issued [Design Documentation Practice Guide for Class 2 buildings](#).

**Do you have to have a change in floor level between the inside and outside of the building for it to be a step down. Can the threshold of the doorway be raised, say 50mm, above the inside and outside floor levels of the building that is waterproofed creating a barrier preventing water entry into the building?**

Doorways are not considered as the internal floor level. Step-downs relate to the internal and external floor and / or substrate levels depending on the compliance matter under question. See *PCD NCC 2025 Volume One Clause F1D4* for an example of this, as well as *AS4654.2* requirements.

**I would like to know more about the movement joints in balcony floors.**

**Also, fixings get used for safety rails, which penetrates through membrane, what are the alternatives?**

Aspects of movement joints were covered in Part 2 of the [webinar](#), while fixings to the balcony were discussed in Part 1. We suggest reviewing the [webinar](#) or [slides](#). Furthermore, *AS4654.2* provides construction details of both movement joints and fixings of balustrades showing how waterproofing needs to be completed to comply.

**Is a drain required to a balcony where the door thresholds are suitable for the vertical upward termination heights and water can otherwise escape, e.g. glass balustrade on spigots to balcony edge?**

**Are balconies required to meet the requirements of AS/NZS 3500.3?**

*Clause 3.8 AS/NZS3500.3 Stormwater Drainage* requires systems for draining balconies and terraces to be designed for 5% AEP (20-years ARI) rainfall intensity and 1% AEP (100-years ARI) rainfall intensity for overflows.



### **Are there any special provisions for vinyl or PVC floor and wall coverings in wet areas?**

Yes, the NCC does have specific provisions for vinyl and PVC floor and wall coverings in wet areas.

The NCC nominates the 'performance requirement' *H4P1*, for wet areas. The DtS pathway to demonstrate compliance with *H4P1*, is provided in the *NCC H4D2*, which requires compliance with *AS 3740 or Part 10.2 of the ABCB Housing Provisions*. While water resistant flexible sheet flooring material with sealed joints (e.g. sheet vinyl) are included in the accepted list of waterproof or water-resistant materials, vinyl planks and tiles are not and may require the formulation of a performance solution.

This is general advice – for detailed guidance specific to your project, consult a qualified building professional to ensure compliance with the NCC and other applicable standards.

**Balconies with tiles set up on plastic pods to create a flush transition to inside allows for wheelchair access. Water drains through the gaps in the pavers to the waterproof membrane below and then to a drain. If the vertical termination complies, is this a DtS solution? I would expect that heavily wind-driven rain could still get in under the door if it can't fall between the tiles fast enough. I also think that the risks could be reduced if a solid balustrade is provided instead of a typical balustrade with vertical rods 125mm apart. Could you please discuss this scenario because a few builders and designers are concerned about potential liability.**

It's difficult to provide answers to a specific scenario with only limited information. However, in theory, a DtS solution should be possible for an access ramp so long as the provisions of *AS/NZS3500.3* and *AS4654.2* are complied with.

**AS 4654.2 does not distinguish between permeable paving surfaces and non-permeable paving surfaces when determining the vertical termination height to a balcony. Can the vertical termination height be measured from the impermeable waterproofed surface / substrate if the balcony paving that sits on top of it consists of a drainage cell and permeable paving such as synthetic grass?**

**Is adding trace wires to liquid membrane to test their water tightness recommended?**

1) *AS4654.2* refers to the 'finished level' through *part 2.8* 'termination of membranes'. Changing the measurement from finished level to the membrane would be inconsistent with *AS4654.2* and no longer be a DtS solution.

2) Trace wires may be considered as a method to go above the minimum requirements of the NCC, however care should be taken to ensure the introduction of these will not compromise the system, and it remains compliant with *AS4654.2*.

**How are step-downs to waterproof decks best achieved given access and zero threshold requirements?**

This issue was raised in the Livable housing webinar earlier this year.

The access and zero threshold requirements in the NCC livable housing standards apply to both Class 1a and Class 2 SOUs, however balconies are exempt from these requirements.

The Standard provides requirements for dwelling access, entrances, internal doors and corridors and other internal parts of the dwelling.



**What are the relevant NCC and BCA clauses to keep an eye out for in relation to the topic?  
What are the suggested white papers / resources for learning more technical details to accurately capture the topic / issues discussed?**

Relevant NCC sections on this topic include:

- *Part F1 Surface water management, rising damp and external waterproofing* of the NCC 2022 Volume One
- *Part H2 Damp and weatherproofing* of the NCC 2022 Volume One
- *Part 10.2 Wet area waterproofing* of the ABCB Housing Provisions.

For more information about upcoming changes in this area, you may also want to look at the [NCC 2025 Public Comment Draft](#), including the ABCB'S page on [improving waterproofing and water shedding provisions](#).

**How to expel internal building moisture when buildings are so well sealed now?  
What is the best practice for cladding and window flashings?**

To manage the risk of condensation in well-sealed buildings in Victoria, it is crucial to focus on effective ventilation and proper installation of cladding and window flashings. For optimal cladding and window flashing, create a ventilated cavity behind cladding to allow moisture escape, using battens or furring strips. Install breathable membranes for moisture control. Use sill, head and side flashings around windows to direct water away, preventing moisture from entering the wall assembly.

**Can we mandate structural cement base flooring in both balconies and wet areas?**

The NCC has specific requirements for waterproofing and water resistance in wet areas and balconies, but it doesn't mandate structural cement base flooring in all cases.

For wet areas (like bathrooms and laundries), the NCC requires that building elements be either waterproof or water-resistant, depending on their location and use. Concrete and compressed FC sheet flooring are commonly used because they meet these requirements.

For balconies, the NCC specifies that waterproofing membranes must comply with *Australian Standards (AS 4654.1 and AS 4654.2)* for external above-ground use. While structural cement base flooring is often used due to its durability and water resistance, the NCC allows for alternative materials, as long as they meet the performance requirements.

**Are floor mounted overflow outlets to an enclosed balcony, a good or bad idea? What would be the preferred overflow outlet method?**

The position and height of overflow outlets on balconies is prescribed in *AS4654.2*. Typically, they are located on the wall or parapet just above the finished floor level of the balcony allowing it to act as an emergency outlet if water begins to rise, by directing it away.

**What would be the correct design for tiled balconies over indoor rooms?**

*AS4564.2* sets out requirements for the design and installation of above-ground external waterproofing membranes for use in buildings and structures. This includes balconies over habitable (indoor) rooms tiled or otherwise designed.

**When will we see mandatory inspections for waterproofing?**

**When will Victoria follow suit with other states and have a secondary waste with nominal fall to all wet areas within the residential sector? E.g. bathrooms laundry areas**

**When will waterproofing become a licenced trade?**

Waterproofing issues have been a significant concern in Victoria, prompting ongoing discussions about reforming building regulations and related legislation. Efforts to address these issues include



the Expert Panel's Stage One report, which recommends mandatory inspections of wet area construction for Class 2 buildings (*Recommendation 14B*). We understand that the DTP is actively working to develop reforms to implement this recommendation. The VBA is also committed to enhancing guidelines and compliance measures to reduce waterproofing failures. Given the persistence of these issues, building regulations will likely continue to evolve to improve waterproofing standards and practices.

**What is the building surveyor's responsibility on items 1, 2 & 3 (design documentation and moisture) as highlighted in the webinar? What is the building inspector's responsibility on inspecting in buildings: Balconies, roofs, and drainage?**

Building surveyors must ensure design documentation has sufficient details and complies with the requirements in the Building Act, Regulations and the NCC.

The builder remains responsible for ensuring the building work complies with the building permit and approved plans, the Building Act, Regulations and the NCC. While there are no current mandatory waterproofing inspections. Building surveyors and inspectors should make sure balconies, roofs and drainages are constructed according to the approved design, comply with structural and safety standards, and are functioning as intended. This includes checking structural integrity, waterproofing, and drainage to prevent water damage and ensure safety.

**How do you get a building permit and plans approved which are signed off via the surveyor, yet they may not be compliant when trades carry out works onsite?**

In Victoria, obtaining a building permit and getting plans approved involves several steps to ensure compliance. However, non-compliance can still arise during construction due to factors like misinterpretation of plans or deviations by tradespeople. To address any issues during construction, the builder remains responsible to ensure the building work complies with the building permit, Building Act and Regulations. The RBS should also be identifying non-compliances when conducting the mandatory stages of inspections. With diligent oversight throughout the construction process, the risk of non-compliance is minimised, ensuring the final build aligns with all regulatory standards.

**Why is it not mandatory for all waterproofing installers to certify their works and provide appropriate insurance cover for the consumer?**

Under the current legislative framework, the builder is responsible for ensuring the building works and completed comply with the Building Act, Regulations and the building permit. This includes where the builder uses sub-contractors, as is often the case with waterproofing installers.

Waterproofing issues have been a significant concern in Victoria, prompting ongoing discussions about reforming building regulations and related legislation. Efforts to address these issues include the Expert Panel's Stage One report, which recommends mandatory inspections of wet area construction for Class 2 buildings and the registration of trades including waterproofing installers. Building regulations are likely continuing to evolve to improve waterproofing standards and practices.

**We talk about new provisions of structural falls on balconies, podium decks etc. Who is going to enforce these are compliant, and how are you going to rectify if work is completed to non-compliance?**

Ensuring compliance with new provisions is a shared responsibility by all practitioners, including architects, building designers, builders, building surveyors and inspectors. Additionally, the VBA is also responsible for monitoring and enforcing compliance with building standards and regulations. The VBA achieves this through various means, including by performing audits on building practitioners and their work to verify compliance and conducting regular inspections of building works to ensure they meet the required standards. When work is found to be non-compliant, the VBA can take several steps to ensure rectification:



- Issuing Directions to Fix: the VBA can issue a Direction to Fix (DtF), compelling the builder to correct the non-compliant work
- Follow-up inspections: After a DtF is issued, the VBA conducts follow-up inspections to ensure the issues have been addressed satisfactorily
- Penalties and prosecutions: If the builder fails to comply with the DtF, the VBA can impose penalties or initiate legal proceedings to enforce compliance.

These measures are part of the VBA's broader compliance and enforcement framework, which aims to protect consumers and maintain high standards in the building industry. For more information about our compliance and enforcement approach visit the [VBA website](#).

**Structural engineers need to have their designs certified by a third-party engineer - there appears to be a lack of (if any) "waterproof design engineers" and therefore no third-party certification. All the risk (re waterproofing solutions) seems to rest with the principle building contractor - and waterproofing of buildings is the single biggest and most common defect in building construction. We have many seminars on waterproofing delivered by experts in the field - but who does the builder turn to, to get a comprehensive warranted waterproof design?**

Waterproofing system designs must be clearly detailed and documented prior to the builder commencing construction or even the building surveyor approving the permit for the proposed works. The design stage is a critical failure point as the research and audit findings suggest. When a builder needs clarification or guidance relating to the design or construction of the waterproofing system, they need to contact the building designer for clarification or guidance. Better collaboration between practitioners under the current legislation will improve the overall construction process reducing the occurrence of water ingress.

**Is there an intention to incorporate a DtS solution for the waterproofing of subterranean constructions (i.e. basements), much like British Standard 8102:2022?**

**Based on the research that was conducted by the BCA, can you define the weak points of a building that allow for the ingress of the water? And does compliance with the BCA does not guarantee a building will be safe from unintentional water ingress?**

As of now, there is no specific indication that the NCC will incorporate a DtS solution for the waterproofing of subterranean constructions, similar to *British Standard 8102:2022*. However, the ABCB has been actively working on identifying potential changes to waterproofing and water shedding provisions in the next edition of the NCC. You can find out more about this initiative, including the Consultation Impact Statement (CRIS), which evaluates the impacts of the proposed provisions, [by visiting the ABCB website](#). In addition, if there are circumstances where a significant issue is identified and can be well documented (e.g. with examples), you can make a submission to the ABCB via the [propose a change website](#).

**Who is liable when water damage is presented within 10 years, but the building is built correctly to code/standard?**

The issue of liability would depend on the causes of water damage. This could involve several factors, including poor design, poor construction practice or latent defects, or poor or inadequate maintenance.

**Is a waterproofing certificate required? What licenced body gives a waterproofing certificate? Who can and can't waterproof balconies and showers and what qualifications are required to waterproof balconies and showers?**

**How does warranty/compliance work with repairs works to balconies and showers on existing buildings?**

In Victoria, the registered building practitioner (builder) is responsible for ensuring that the waterproofing work complies with the Building Act, Regulations and the approved building permit. This includes when the builder themselves completes the work or uses sub-contractors complete the



works. Additionally, the RBS is responsible for ensuring that the building work and building permit will comply with the Building Act and Building Regulations, under *Section 24* of the Building Act.

A certificate of compliance for waterproofing may be requested by the RBS or supplied by the builder to certify that the waterproofing works complies with the Building Act, Regulations and approved building permit, however compliance is still the responsibility of the builder.

Warranties and insurance requirements apply to building work even when they relate to repairs or renovations of existing buildings. Domestic building insurance (DBI) is required to be provided by a builder when the cost of domestic building work under the contract (even for repair works) is more than \$16,000, including labour and material costs. DBI, however, only covers incomplete or defective work when a builder becomes insolvent, dies or disappears.

For information relating to DBI, please refer to the VBA [website](#). A builder who undertakes repair work on existing domestic buildings also has implied warranties under the *Domestic Building Contracts Act*.

### **Who is responsible for balcony performance including drainage?**

Architects and building designers are responsible for producing compliant designs balcony drainage systems. They may engage plumbers, hydraulic engineers or other suitably qualified persons to ensure the drainage system complies.

Building surveyors have a responsibility to assess and confirm compliance of the drainage design, while the builder has the responsibility under *Section 16* of the Building Act to build works that are compliant with the Building Act, Regulations and building permit.

### **Is there a standard to be introduced for waterproofing of structures below ground such as basements and integrated retaining walls?**

Currently, the NCC does not reference a specific Standard for below ground waterproofing and a Performance Solution would be required to meet the performance requirements under the NCC. The proposed performance solution can utilise site specific strategies principles in *AS4654.2* and the *British Standard 8102*, can be a useful guideline.

### **How is the VBA proposing to better train contractors regarding the required outcomes for waterproofing systems.**

### **Do the VBA propose to have a campaign on the ground with VBA inspectors focusing on this with education and enforcement?**

The VBA is actively collaborating with industry partners to enhance waterproofing education and qualifications. While existing courses address waterproofing broadly, the VBA is exploring the development of targeted short courses and webinars focused on specific waterproofing challenges, from design and installation to inspection.

The VBA recently launched a targeted inspections campaign designed to raise awareness and reduce the risk of water damage. If you'd like to learn more about the goals of the campaign, the supporting research and resources for practitioners and consumers, please [visit the VBA website](#).

### **How can owners affected by leaking balconies have this rectified at the builder's cost - if under 10 years?**

While we cannot provide advice on contractual matters, the first step is to contact the builder directly and inform them of the issue. Builders are required to provide implied warranties that ensure their work is done in a proper and workmanlike manner, using suitable materials and in accordance with the plans and specifications. If the builder is unresponsive or refuses to fix the issue, you can lodge a



complaint with Domestic Building Dispute Resolution Victoria (DBDRV). They offer a free service to help resolve disputes between homeowners and builders.

### **Why aren't building being waterproofed correctly?**

Research projects conducted in this area identified the root cause of problematic waterproofing work was likely attributed to one or more of the following factors:

1. Poor design documentation, including lack of details in the documentation
2. Design choices which may complicate weatherproofing and affect watertightness
3. An unclear chain of responsibility and accountability for design and installation of waterproofing
4. Lack of understanding and misinterpretations of waterproofing requirements among practitioners
5. Poor coordination and collaboration between building practitioners during design stages.

For more information, please visit the VBA [research page](#), where you can view and download our comprehensive research reports.

### **What are the most common causes of failed balconies?**

Common causes of balcony related leaks include:

- Poor design or lack of sufficient design documentation detailing
- Lack of coordination and planning by all relevant practitioners from the initial design stage to the delivery of the as-built constructed works
- Lack of fall in substrates
- Incorrectly located drainage or non-compliant drainage
- Defects in application of waterproofing membranes
- Junctions, such as at hobs, drains, floor to external wall, balustrade connection, penetrations (such as downpipes) and door thresholds, amongst others, are not detailed or constructed correctly.

Research has identified these areas as prone to failure and at risk of water ingress. VBA research on these common failures will be released soon and will be available on VBA [research page](#).

**What are some of the most common construction issues that lead to water ingress into buildings? What are the main issues that are seen on site relating to this issue? How can these issues be designed out? Are there effective means of preventing water ingress that just haven't been adopted, in your opinion?**

Common causes of balcony related leaks include:

- Poor design or lack of sufficient design documentation detailing
- Lack of coordination and planning by all relevant practitioners from the initial design stage to the delivery of the as-built constructed works
- Lack of fall in substrates
- Incorrectly located drainage or non-compliant drainage
- Defects in application of waterproofing membranes
- Junctions, such as at hobs, drains, floor to external wall, balustrade connection, penetrations (such as downpipes) and door thresholds, amongst others, are not detailed or constructed correctly.

The failure to follow manufacturer's installation instructions is also a common cause for water ingress problems. These may be manufacturers for waterproofing or cladding. It is much more common to find problems with the way materials are installed, rather than with the materials themselves.



Improvements in designs and detailing in design documentation, compliance with regulatory requirements, both at the design stage and construction stage, good construction practices and quality assurance on site, and effective and regular maintenance by owners post-occupancy are some of the ways to prevent or mitigate water ingress into buildings.

### **How long does mold take to establish in a home with a shower leak and once the source has been repaired, how long will the mold be active?**

There is no specific guidance around this, however, given the right conditions, mould can begin growing within a few days of exposure to moisture. From a health perspective, once you can see visible mould you have an issue, so it is something that must be remediated.

Mould can remain active while moisture is still present. There are methods for remediating building materials affected by mould, however determining the right solution for a specific context is a specialised area. Advice on whether the material can be remediated or whether replacement is required should be sought from a mould remediation specialist and structural engineer.

### **Is all water ingress within building line considered a major/structural defect?**

Assuming that the question is in the context of DBI, water ingress can potentially be classified as a structural defect, defined in the [Domestic Building Insurance Ministerial Order](#).

### **Is water ingress from a roof into eave lining a major defect?**

Roof eaves are typically constructed with FC sheets. FC sheets are manufactured with cellulose fibres which can act as a nutrient base for mould. The alkalinity of the FC sheet reduces the onset of mould, but if left damp for extended periods, FC can nevertheless become mouldy. The NCC 2022 performance requirement *Weatherproofing H2P2* includes the prevention of unhealthy conditions and deterioration of materials. Thus, water ingress from a roof into the eave lining is potentially a matter of non-compliance.

### **Is there any intention in the medium / long term from the VBA to mandate that roof cover be applied to new balconies - especially in the design stage?**

The VBA considers water ingress in buildings caused by non-compliant designs or building or plumbing work to be a priority harm. The VBA is tackling water ingress issues through a multi-faceted approach, including [undertaking targeted inspections focused on balcony waterproofing](#).

The VBA cannot mandate changes to construction or building requirements that are set out in the NCC. The VBA has presented persuasive evidence through its submissions, research and other activities to influence changes to the NCC.

The ABCB has proposed several updates for the NCC 2025 to improve waterproofing and water shedding for balconies, including new DtS provisions requiring concrete roofs, balconies and podiums to include step-downs from internal areas and specifying the use of structural substrates for balconies to maintain the integrity of waterproofing. These changes aim to resolve issues stemming from the lack of sub-surface water management in NCC 2022 and clarify the interpretation and application of multiple performance requirements.

### **Are water ingress issues covered by the property insurance and what's the warranty obligation to the builder?**

Water ingress issues can be complex when it comes to property insurance and builder warranties.

Property insurance usually covers sudden, accidental water damage, like from a burst pipe or storm, but not gradual damage from leaks or poor maintenance. It is important to check the specific terms of your insurance policy to understand what is included.



Under Victorian law, builders are required to provide a statutory warranty, generally covering waterproofing defects for up to ten years from the completion date of the construction. This includes compliance with the NCC and relevant Australian Standards for waterproofing, particularly in areas like bathrooms and balconies. If a builder fails to meet these standards, they are obligated to address the defect, or in some cases, an insurer may step in under warranty insurance provisions if the builder is unavailable.

For more information visit the Consumer Affairs Victoria (CAV) page on [implied warranties and domestic building insurance](#).

### **Is AS 4654 appropriate for repair work when it's tailored to absolutely new construction?**

AS4654.2, which covers waterproofing membranes for external above-ground use, is primarily designed for new construction projects. However, it can still be applicable for repair work, provided the specific conditions and requirements of the repair align with the standards set out in AS4654.2.

For repair work, it's crucial to ensure that the materials and installation methods used are compatible with the existing structures and that they meet the performance criteria outlined in the standard.

### **What are the reasons domestic waterproofing is not a mandated inspection?**

Waterproofing issues have been a significant concern in Victoria, prompting ongoing discussions about reforming building regulations and related legislation. Efforts to address these issues include the Expert Panel's Stage One report, which recommends mandatory inspections of wet area construction for Class 2 buildings (Recommendation 14B). We understand that the DTP is actively working to develop reforms to implement this recommendation.

The VBA is also committed to enhancing guidelines and compliance measures to reduce waterproofing failures. Given the persistence of these issues, building regulations will likely continue to evolve to improve water shedding and waterproofing standards and practices.

### **The current process using Building Surveyors for inspecting high risk areas if building works is not working. Particularly for flat metal roofing, waterproofing, ventilation, etc. What are we going to do about it?**

Thank you for your comment. All parties in the construction process are responsible for ensuring building work results in safe, durable and well-built buildings.

As indicated in the webinar, waterproofing issues have been a significant concern in Victoria, prompting ongoing discussions about reforming building regulations and related legislation. Efforts to address these issues include the Expert Panel's Stage One report, which recommends mandatory inspections of wet area construction for Class 2 buildings (Recommendation 14B). We understand that the DTP is actively working to develop reforms to implement this recommendation. The VBA is also committed to enhancing guidelines and compliance measures to reduce waterproofing failures. Given the persistence of these issues, building regulations will likely continue to evolve to improve water shedding and waterproofing standards and practices.

### **Can the VBA issue a link or PDF to the Victorian Managed Insurance Authority (VMIA) and DBDRV dataset?**

You can download the *Examining indoor mould and moisture damage in Victorian residential buildings* research report that involved the VMIA data on the [VBA website](#).

The research report involving the DBDRV data will be released soon.

### **Which consultant is responsible for specifying waterproofing?**

The builder oversees the entire construction process and holds ultimate responsibility for its outcome. However, issues with waterproofing can stem from design, material selection or inadequate



construction practices. Therefore, all design and construction team members must be thoroughly informed and ensure that proper methods are specified and implemented.

**How would we get around ensuring there would be no issues with water entering the building with respect to the new NCC requiring accessibility ramps at entries?**

*NCC Clause H2D2 - Drainage*, requires compliance with *Clause 3.3.3 of the Housing Provisions*, which contains a limitation statement excluding a landing area provided for the purposes of *Part 2.3 of the Livable Housing Design Standard*.

In summary *NCC Clause 3.3.3 - Surface Water Drainage* does not apply to a landing area provided for the purposes of *Part 2.3 of the Livable housing design standard*, except for a channel drain or drainage surface provided under *Part 2.4 of the Livable Housing Design Standard*.

**The images you have shown for efflorescence appear to be more what is known as latex leaching. This is a well-documented issue. Can you please clarify the difference, and will this be corrected in the revised Guide to Standards and Tolerances (GTST)?**

The key difference between efflorescence and latex leaching is the source of the residue. Efflorescence is caused by soluble salts migrating to the surface of porous materials like concrete, brick or stone, while latex leaching is due to latex additives within grouts and adhesives being drawn to the surface by moisture.

Please note, the GTST is only an advisory document and is not a regulated standard and is not part of the Victorian legislative framework. As it is a guide only, all other documents prescribing statutory or contractual requirements (relevant to the building work the subject of a dispute), take precedence over the GTST. The GTST was first published by the VBA in 2015 and is currently under review.

**Is the VBA working with industry to create a course and qualification for waterproofing (Design/installation/inspection) given that it causes so many issues?**

The VBA is actively collaborating with industry partners to enhance waterproofing education and qualifications. While existing courses address waterproofing broadly, the VBA is exploring the development of targeted short courses and webinars focused on specific waterproofing challenges, from design and installation, to inspection.

**Does this mean that it's acceptable for water to pass through the balcony tiles and grout and have efflorescence forming. It's only a defect if it passes the water proofing membrane and leaks below?**

It is not a matter of non-compliance if water does not pass through the waterproofing membrane of a balcony. However, even if this is the case and efflorescence forms as a result, this will still be considered a defect. Matters of 'non-compliance' are addressed by the RBS using actions such as building notices and building orders through the Building Act. 'Defective building work' are matters to be taken up with the builder through s.8 'implied warranties' of the *Domestic Building Contracts Act 1995*.



**1. AS/NZS 3500.3 is somewhat silent about drainage for Balcony and Terrace areas other than to say**

**"Systems for draining balconies and terraces shall be designed for -**

**(a) In Australia -**

**(i) 5% Annual Exceedance Probability (AEP) (20 years ARI) rainfall intensity; and**

**(ii) 1% AEP (100 years ARI) rainfall intensity for overflow.**

**Similar for NZ**

**However the standard does not say how to calculate the overflow required, nor how to achieve compliance.**

**One must infer that overflow requirements are calculated in the same manner as a roof.**

**However, I believe there are very few people in the domestic building industry who are aware of aware of this.**

**Hard to believe that the Standard was updated in 2021 and this (known) issue was not addressed.**

**2. Can Dr Tim Law advise on overflow provision for balcony design. should this be sized as per box gutter as stated in both HB 39 and As 3500 .3**

As noted, *Clause 3.8 AS/NZS3500.3 Stormwater Drainage* requires systems for draining balconies and terraces to be designed for 5% AEP (20-years ARI) rainfall intensity and 1% AEP (100-years ARI) rainfall intensity for overflows. While there is no prescribed method for the sizing of the balcony drainage, *Standards Australia Handbook - SA HB 39* has a note that states the general design and sizing principals of roof drainage systems (*AS/NZS3500.3*) may be also utilised when installing drainage outlets, downpipes and overflow provisions in the above ground external areas of buildings, such as drains from balconies, patios and the like.

We would recommend speaking to hydraulic engineer or an appropriately qualified person to advise on the appropriate methodology to meet the requirements in the Standard for each specific design.

**Should those that install both balcony membranes and wet area membranes be registered? Are there any ongoing discussions to register waterproofing installers?**

Currently, the VBA currently registers water proofers in the registration category domestic builder (limited to waterproofing) and commercial building (limited to waterproofing). Registered builders are responsible for their subcontractors who install waterproofing membranes.

The proposed Trades Registration scheme, which envisages registration of waterproofing installers, is currently under consideration by the Victorian Government, including consultation on the registration, insurance and other requirements for trades registration.

**If you are using a Waterproofing contractor without a least a Cert III in Construction Waterproofing, then it is very likely they have had very limited training and perhaps no training ever on the standards.**

A Cert III in Construction Waterproofing is the prescribed qualification for registration as a domestic builder (limited to waterproofing) or as a commercial builder (limited to waterproofing).

**Dr Tim Law is incorrect in relation to his comment regarding the rainhead only needing a hole in the front at the same size as the downpipe. He was initially correct when he said an open weir. At no sage has any standard advised this for a box gutter rainhead.**

Thank you for the opportunity to clarify. As some of the case studies were disputed matters for a building constructed several years ago, there was a lack of clarity in whether these rainheads could have been installed when rainhead overflows complied with Figure 5.7.3 from either *HB39:1997* or *HB39:2015* (the version prior to the amendment published 30/07/2021). The *HB39* had illustrations for rainheads with holes in the sides. This option was not available under *AS3500.3* but has



nevertheless led to confusion in the industry until a clarification was published by the VBA on 27/05/2022.

**Is it more appropriate to install the waterproofing membrane on the sloping substrate or if it is not sloping then onto a screed with falls that is installed on the substrate?**

Research suggest that the fall should be provided to the structural substrate with waterproofing applied to the structural substrate as well. Furthermore, NCC 2025 Volume One Public comment draft *Clause F1D7* requires the waterproofing membrane to be installed directly on the structural substrate for roofs, balconies or similar surfaces.

**When the base of a waffle pod slab is sitting in water table (e.g. winter), it would appear that if the building envelope is heated unlimited amounts of moisture can be released into the air in the building. Is this correct?**

While we cannot provide a definitive answer to the hypothetical question, we note that the NCC generally requires the use of vapour barriers under the slab for the purposes of preventing moisture from the soil permeating up through the slab into the house via rising damp.

**Is the habitable room floor level on the same storey required to be above the balcony floor level? A concrete hob has been designed between the balcony and the habitable room on the same storey as the balcony.**

The use of a concrete hob between the balcony and the habitable room is a common practice to create a physical barrier that helps prevent water from entering the habitable space. However, requirements for step-downs have been proposed in PCD NCC 2025 Volume One *Clause F1D4*. This means that the balcony substrate level will need to be lower than the building internal floor level. Please review this clause to understand the proposed change.

**Poll question 2 seems a bit questionable, DDA requirements, undercover shopfronts etc, makes this impractical in a lot of situations and AS2047 specifies sheltering rather than steps.**

**Is there plans to more clearly layout what is sufficient for sheltering of DDA thresholds?**

To clarify, the prevention of water entry at thresholds (Poll question 2) was in relation to balcony door thresholds in residential buildings. The answer thereby being: c) To prevent water entry, the design for membrane terminations at entry thresholds must comply with the upward termination height requirements in *Clause 2.8.1.1 of AS4654.2*.

**Can overflow from balconies discharge over the boundary on to a laneway/footpath or to a lower balcony below in the same building?**

We would encourage you to please review Part 1.2 of the webinar.

**How can an RBS be sure that a DtS solution for a roof drainage system is compliant without seeing computations of flow rates and sizing for box gutter systems? A compliance certificate alone is insufficient without computations as per general method in AS 3500.3.**

In addition to Regulation 24(4), requirements for sufficient information in a building permit application, the RBS can request additional information, such as evidence under *Part A5* of the NCC (computations) if they are not satisfied that that compliance has been demonstrated.

**Why are building designers and architects not required by law to certify their design documents to confirm meeting minimum requirements? This would bring up the standards of documents being prepared for permit applications.**

Registered architects are regulated by the Architects Registration Board of Victoria (ARBV) under the *Architects Act 1991*, while building designers registered by the VBA are regulated under the Building Act and Building Regulations.



There is no current legislation that requires either to certify design documents, however requirements to provide sufficient information showing the building work to comply (min standards) at the building permit application stage are contained in the Building Regulations.

This is an area for reform that has been recommended by the Expert Panel on the Building System Review and is under consideration by government.

**How does the VBA propose to resolve the conflict between competitive tendering for design services & the requirements to document adequately? The NCC provides a solution for construction services by requiring minimum standards, but the ACCC outlawed minimum fees to ensure adequate documentation.**

Contractual matters relating to competitive tendering or fees charged are not within the scope of operation of the VBA. The VBA will regulate matters relating to insufficient documentation that are within scope of the current regulatory framework.

**Currently the performance provisions does not recognize the use of rain screens or cavity construction. Further to this water shedding design principals must be considered prior to the approval or building permit process. How are these design requirements being educated to architects and designers?**

While cavity construction is limited to specific construction types under the current DtS provisions, architects and designers can still incorporate these approaches through a performance solution pathway. Additionally, if there are well-documented examples or significant issues identified in this area, a submission can be made to the ABCB through their [propose a change website](#).

While it could be assumed that architects and designers receive education on cavity construction and water-shedding principles, the ARBV and the Australian Institute of Architects (AIA) would be best positioned to confirm the details of this training.

**Eaves overhangs are almost extinct. Please explain how to work in the real world of eave less building with parapet cappings and box gutter. This drawing is not realistic with current building practices in Victoria.**

The use of eaves is considered good water shedding practice. However, depending on the design and where eaves are not provided, AS4564.2 provides details of compliant parapets, box gutters and other wall and roof junctions to mitigate water ingress into buildings.

**Is the evaluation of risk scores within the BCA a good guide for assessing the ability of a building to shed water on a base level? Also, where you have cases of cladding requiring a risk score of less than 20, how would you go about meeting that requirement without design changes?**

The use of the verification method for weatherproofing is limited to that application, however it provides a sound basis of design factors and their associated risks. For assistance with using the verification method in specific designs, we advise you to contact a building designer or relevant expert.

**Who's going to check on these structural falls on construction sites and will it be done to every project?**

In Victoria, the builder has the responsibility to ensure the building work is completed according to the Building Act, Regulations and approved plans. It is envisaged that if the proposed NCC 2025 changes commence, structural falls will need to be achieved by the builder and checked by the RBS.

Generally, it is important to note that not every project will have the same number of inspections. The frequency and stages of mandatory inspections are determined by the RBS based on the type and complexity of the project. The RBS can require additional inspections if they deem it necessary to



ensure compliance with specific aspects of the construction, such as structural falls, where nominated.

**There are times when meeting the waterproofing standards and NCC requirements is difficult when applied to heritage structures which have restrictions. Is there any discussion on whether the building code prevails over directions from Heritage Victoria? For example, a membrane is not allowed to be applied to the heritage wall.**

Typically, where there is a heritage building that has requirements that conflict with the DtS provisions of the NCC, a performance solution would be required to achieve an acceptable design solution. Alternatively, there is also the modification pathway via the Building Appeals Board (BAB) under *Section 160* of the Building Act.

**Do we have min height requirement for overflow above low balcony level (drainage level)? also between overflow and internal surface level?**

The NCC specifies requirements for overflow measures to ensure proper drainage and prevent water ingress. The NCC requires overflow drains should be installed with the inlet flow line located at least 51 mm above the low point of the roof or balcony.

**Plans for additions, sheds, etc., often show storm water drainage "to existing" without confirming if there is an existing SWD system**

A design of a storm water drainage system must be provided and approved by the RBS - Regulation 133. This and details necessary to show compliance, such as the location of storm water drains and the layout of drains to the point of discharge must be shown on an allotment plan when applying to construct or alter a building – Regulation 25. Note, a report and consent from council indicating the location of the point of discharge must also be included in the building permit application under Regulation 133.

**When is it required to have a building permit for maintenance and repairs of an existing balcony membrane?**

For guidance on when a building permit is required or exempted, please refer to the VBA Practice Note [\*Building permits and other exemptions BP 01 | When is a building permit required.\*](#)

**Is there formal training/testing in regards to roof design compliance required for building designers (draftees/architects) prior to them getting registered/certified?**

To gain registration in the category of building design (architectural), an applicant must be able to apply their knowledge of the requirements of the relevant building legislation, regulations and Australian Standards to the design (including plans and specifications) of all classes of building and types of construction and demonstrate at least two years supervised practical experience preparing Class 1 and Class 2 to 9 technical building design (architectural) drawings.

More information on the requirements for registration in the category of Building design (architectural) can be found on the [VBA website](#).

Architects are registered by the ARBV. For registration criteria and relevant requirements please visit the [ARBV website](#).

**Who is responsible for a non-compliant installation of a rainhead; builder, plumber, building surveyor or building inspector?**

Without all the detail, we can't provide a specific answer. However, we need to remember that compliance is a shared responsibility. The designer must design a compliant drainage system (this could be with the assistance of a plumber or hydraulic engineer), the RBS is required to assess and determine if the system design and installation is compliant before issuing the permit and the installer



(plumber or builder) must then install the system as required to comply with the Building Act, Regulations and building permit.

**Whose responsibility is it to ensure waterproofing and water shedding is designed and implemented adequately?**

The building designer is responsible for producing compliant design documentation. The RBS is responsible for assessing and approving compliance. The builder is responsible for building the proposed works in accordance with the Building Act, Regulations and building permit.

**When will the waterproofing AS be updated to include new systems and technologies that are commonly used in construction these days? E.g. pod and paver system, setdown shower base with flush tile finish with main bathroom tiles, other waterproofing methods, etc.**

Proposed changes to the Australian Standards or the NCC can be made via a [proposal for change \(PFC\) application](#) to the ABCB.

**How are slab/floor falls best controlled and managed during the construction to ensure they are done correctly?**

Slab falls are best controlled at the design stage using detailed construction drawings that clearly indicate the required falls and drainage points. During construction, the builder may need to check with the designer on the suitability of the construction method they propose to use to best achieve the falls.

**Can the problem of condensation be understood and addressed as a form of water collection behind facades. The webinar has not considered the issue of condensation through precast concrete wall construction in residential buildings. Could you comment on this and how the regulations consider this issue?**

Condensation has been covered in previous VBA webinars:

- [Research insights: Management of Condensation and Mould Growth Risk](#) in September 2024
- [Introduction to Condensation Management NCC 2022](#) in August 2023.

**With all these issues with water damage and water entering properties from these facades and balconies that he was talking about, how has these designs become so popular and have passed engineering with this being a known issue?**

Unfortunately, it is a complex matter without a single answer. The research and audit findings suggest water ingress involves design evolution, introduction of new buildings systems, innovative materials and practitioner competency issues (design, building and surveying), amongst other factors. What is clear is that we need to improve documentation and building practices to prevent water ingress.

**When are we going to make everyone on the site responsible for their part, i.e. the contractor who does not have a registration, but is employed to install these systems which are obviously failing?**

In late 2018, the Victorian Government made amendments to the Building Act to introduce a new registration and licensing scheme for tradespeople. The scheme aims to reduce non-compliant building work, enhance industry accountability and encourage skills formation. Reforms continue to progress to implement the Trades Registration scheme.

**What is the percentage of defective falls to drains in the overall defects?**

You can download the *Examining indoor mould and moisture damage in Victorian residential buildings* research report that involved the VMIA data on the [VBA website](#).



The research report involving the DBDRV data will be released soon.

**Since waterproofing and water shedding seem to be one of the major and more expensive defects, do you think this part of the design and implementation warrants further peer review/auditing to ensure good design, feasible and practical buildability and implementation. In low rise residential construction where balconies are built over habitable rooms areas below. Given the amount of water ingress and high failure rate found to date - Why should the balcony not be designed as a compliant roof system first ( metal deck ) and as a functional balcony second ?**

As covered in the [webinar](#), there are key issues identified through the research, inspections and auditing that increase the likelihood of water ingress in buildings (particularly balconies over habitable rooms). These issues can be found at the design stage, during construction and from lack of maintenance of balconies, roofs and drainage surfaces by owners.

Improvements to designs, better construction practice and practitioner accountability can improve the quality of buildings. In addition, legislative changes such as those currently being developed can further support improved compliance reducing the occurrence of water ingress in buildings.

*For technical information or clarification please contact the Technical and Regulation Team via [technicalenquiry@vba.vic.gov.au](mailto:technicalenquiry@vba.vic.gov.au). For information about the research, please contact the Research and Evaluation team via [research@vba.vic.gov.au](mailto:research@vba.vic.gov.au).*

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