EXPERT DEFECT & COMPLIANCE REPORT: ROOF PLUMBING AUDIT

Property Address: [redacted] Eumemmerring, Victoria 3177

Clients: [redacted]

Date of Inspection: January 26, 2026

Inspecting Authority: Victor C, Compliance Manager, HolyMess Repairs (Licence No. 32176)

Reference: [redacted]

1.0 Executive Summary and Scope of Engagement

1.1 Overview

This forensic audit report has been commissioned by [redacted] to evaluate the compliance, workmanship, and structural integrity of the recently installed metal roofing system at their property in Eumemmerring. The installation, performed by a previous contractor, has exhibited signs of systemic failure, prompting this third-party review.

As the Compliance Manager for HolyMess Repairs (Licence No. 32176), I, Victor C, have conducted a rigorous analysis of the site evidence provided (Images 1 through 7 and video context). This report is not merely a quotation for repairs; it is a formal expert instrument designed to withstand scrutiny in potential legal or regulatory proceedings, including the Victorian Civil and Administrative Tribunal (VCAT) or disputes lodged with the Victorian Building Authority (VBA).

1.2 Scope of Analysis

The audit assesses the "as-constructed" status of the roof plumbing against the strict legislative hierarchy governing the Victorian construction industry. The installation is evaluated against:

- **The Building Act 1993** & **Building Regulations 2018** (and relevant historical contexts of the 2008 Regulations).
- **The Plumbing Regulations 2018**.
- **The National Construction Code (NCC) 2022 / Building Code of Australia (BCA) Vol 2**.
- **Australian Standards:** specifically AS/NZS 3500.3 (Stormwater Drainage) and AS 1562.1 (Metal Roofing).

- **SA HB 39:2015:** The Installation Code for Metal Roof and Wall Cladding.
- **Occupational Health and Safety (OHS) Act 2004** & **Regulations 2017**.
- **Professional Engineers Registration Act 2019**.

1.3 Critical Findings Summary

The investigation has identified **seven (7) major categories of non-compliance**, ranging from hydraulic design failures to prohibited material interactions. The cumulative effect of these defects renders the roof "Non-Compliant" under Part 12A of the *Building Act 1993*. The current state of the roof poses an immediate risk of water ingress, structural degradation, and potential mold-related health hazards. Furthermore, the installation appears to violate the *Professional Engineers Registration Act 2019* due to uncertified alterations of drainage systems.

2.0 Regulatory Framework and Legislative Context

To comprehend the gravity of the defects identified at [redacted] one must understand the binding nature of the regulatory framework in Victoria. Ignorance of these statutes does not absolve the original installer of liability.

2.1 The Building Act 1993 (Victoria)

The *Building Act 1993* is the paramount legislation.

- **Section 16 (Offences):** It is a criminal offence to carry out building work that does not comply with the Act or the Regulations. The maximum penalty for a natural person is **500 penalty units**. As of the 2025/2026 financial year, with a penalty unit value indexed to approximately $197.59, this equates to a potential fine of nearly **$98,795**.
- **Section 137E (Insurance):** mandates that domestic building work over $16,000 must be covered by Domestic Building Insurance (DBI). The defects identified suggest work that would trigger a claim under this policy for "defective" and "incomplete" work.

2.2 Plumbing Regulations 2018

These regulations call up the specific technical standards (AS/NZS 3500.3 and HB 39) as mandatory "Deemed-to-Satisfy" solutions.

- **Regulation 7:** States that plumbing work must comply with the PCA (Plumbing Code of Australia), which in turn references AS 3500.3.
- **Compliance Certificates:** Under **Section 221ZH of the Building Act**, a licensed plumber must issue a compliance certificate for work costing $750 or more. This certificate is a signed declaration that the work complies. If the original installer issued a certificate for the work shown in Images 1-7, they may have committed a fraudulent act by certifying non-compliant work, which carries its own set of VBA disciplinary sanctions,

including license suspension.

2.3 The "Self-Certification" Trap

Victoria operates on a self-certification model for plumbing. The installer bears total responsibility for the design and execution. Unlike general carpentry where a surveyor inspects the frame, roof plumbing is often hidden before inspection. This places a heavy burden of proof on the plumber. The defects noted in this report suggest the original installer failed to understand the "Performance Requirements" of the NCC, specifically **FP1.4 (Weatherproofing)**, which mandates that a roof must prevent water penetration that could cause unhealthy conditions or loss of amenity.

2.4 Occupational Health and Safety (OHS) Act 2004

The *OHS Act 2004* places a duty of care on the contractor to ensure no person is exposed to risks to their health or safety.

- **Falls from Heights:** The video context implies work was done on a second-story roof. The *OHS Regulations 2017 (Part 3.3 - Prevention of Falls)* require passive fall protection (guard rails) for risks over 2 meters. If the installer worked without these, the homeowner could inadvertently be drawn into a liability claim if an accident had occurred. Furthermore, the lack of installed anchor points for future maintenance (as seen in the images) creates an ongoing hazard for the client, violating the "Safety in Design" principles implicit in the Act.

3.0 Forensic Analysis of Site Evidence

This section provides a granular analysis of the visual evidence. Each image is treated as a distinct data point demonstrating a specific failure mode.

3.1 Analysis of Image 1: The Non-Compliant Box Gutter Termination

3.1.1 Visual Evidence

Image 1 captures the critical junction where an internal box gutter feeds into a rainwater head.

- **Geometry:** The box gutter appears to be fabricated from Colorbond steel. It terminates directly into a dark grey (likely Colorbond Monument) rainhead.
- **The Joint:** The connection relies on a direct mechanical fixture with heavy silicone application.
- **The Weir:** Crucially, the front face of the rainhead (the overflow weir) appears to be at the same level as, or higher than, the "sole" (floor) of the box gutter.

3.1.2 Regulatory Breaches

Primary Breach: AS/NZS 3500.3:2021 Clause 3.7.3 & HB 39 Clause 5.3

The standard mandates that a rainhead must act as a "hydraulic break." It serves two functions: to collect water from the box gutter and to provide an emergency overflow path if the downpipe is blocked.

- **The 25mm Rule:** AS/NZS 3500.3 explicitly states that the overflow weir of the rainhead must be located a minimum of **25mm below the sole of the box gutter**.
- **Violation:** In Image 1, this vertical separation is non-existent.

Secondary Breach: VBA Practice Note RP-02 (Box Gutters)

The VBA explicitly warns against "sealed" systems where the box gutter is riveted to the rainhead without a relief gap.

- **Violation:** The image shows a "congested" interface. If the downpipe blocks, the water level in the rainhead will rise instantly into the box gutter. Because there is no 25mm drop, there is no "freeboard" (safety margin). The water will surcharge and flow backwards up the box gutter. Since box gutters typically have a shallow fall (1:200), the water will quickly reach the internal eaves/ceiling interface.

3.1.3 The Physics of Failure

This setup creates a "backwater curve." In a high-intensity storm (common in Melbourne), the transition from the horizontal flow (box gutter) to vertical flow (downpipe) creates turbulence. This turbulence introduces air into the stream, reducing the effective capacity of the downpipe.

Without the 25mm air gap, this turbulence pushes water back up the gutter. The hydraulic pressure will force water through the silicone seals (which will eventually fail due to thermal expansion), leading to internal flooding.

3.1.4 Rectification Methodology

1. **Detach and Discard:** The existing rainhead must be removed.
2. **Sizing Calculation:** A hydraulic calculation per AS 3500.3 must be performed to determine the required size of the new rainhead based on the catchment area (m^2) and Eumemmerring's rainfall intensity (approx. 186mm/hr for 5-min duration).
3. **Refabrication:** Fabricate a new rainhead with a deeper collection sump.
4. **Installation:** Install the new rainhead such that the overflow weir is physically cut 25mm lower than the box gutter outlet.
5. **Opening:** Ensure the front of the rainhead is open to the atmosphere to allow visible discharge during overflow events.

3.2 Analysis of Image 2: Undersized Sump and Lack of Overflow

3.2.1 Visual Evidence

Image 2 depicts a sump installed within the roof tray system, likely intended to catch water from a valley or box gutter change of direction.

- **Dimensions:** The sump appears shallow, likely matching the depth of the roof ribs (approx. 50mm-70mm).
- **Outlet:** A pop is visible, but no dedicated side overflow channel is apparent.
- **Debris:** There is visible accumulation of silt and organic matter, indicating poor self-cleaning velocity.

3.2.2 Regulatory Breaches

Primary Breach: AS/NZS 3500.3 - Sump Sizing

Sumps are critical for "calming" the water before it enters the downpipe.

- **Requirement:** A sump must be sized to eliminate vortex formation (the "whirlpool" effect) which restricts flow. For a standard 100x75mm downpipe, the sump typically requires a depth of at least 300mm-400mm depending on flow.
- **Violation:** The shallow sump in Image 2 (estimated <100mm) prevents the formation of a stable hydraulic head. This acts as a choke point, significantly reducing the drainage capacity of the entire roof section.

Secondary Breach: Lack of Overflow (AS 3500.3 Clause 4.5)

- **Requirement:** Every box gutter system *must* have an overflow provision capable of carrying the *total* design flow (100% capacity) in the event of a blockage.
- **Violation:** There is no visible side channel, weir, or "Dam Buster" device. If the bottom outlet blocks with the debris seen in the image, the sump will fill in seconds and water will overflow into the roof cavity.

3.2.3 The Physics of Failure

Without adequate depth, the water entering the downpipe creates a "weir flow" rather than "orifice flow." This is inefficient. Furthermore, the lack of an overflow creates a "single point of failure" system. In risk management terms, this is catastrophic. A single tennis ball or bird's nest results in certain internal flooding.

3.2.4 Rectification Methodology

1. **Sump Expansion:** Excavate the existing sump area. Frame out the timber structure to accommodate a deeper sump (minimum 300mm, subject to structural constraints).
2. **Overflow Installation:** Fabricate a sump with a side overflow duct that extends through the parapet wall or fascia to discharge visibly to the ground.
3. **Alternative:** If depth is restricted by ceiling height, install a "Dam Buster" side-outlet sump, which is engineered to perform in low-profile scenarios while meeting compliance through testing.

3.3 Analysis of Image 3: Silicone Dependency and Flashing Defects

3.3.1 Visual Evidence

Image 3 shows the interface between the roof sheets and a parapet wall/capping.

- **Sealant:** There is a copious application of silicone sealant smeared over the junction where the flashing meets the roof ribs.
- **Profiling:** The flashing does not appear to be "scribed" (cut to profile) to match the corrugations of the roof sheet.
- **Fixings:** Fixing screws are visible through the flashing into the rib.

3.3.2 Regulatory Breaches

Primary Breach: SA HB 39:2015 Clause 8.2 (Flashings)

- **Requirement:** Flashings must be manufactured from compatible materials and designed to allow for thermal movement. Crucially, the handbook dictates that flashings should be scribed or notched to fit the profile of the roof sheet to prevent wind-driven rain entry.
- **The "Silicone Rule":** While silicone is permitted as a secondary seal, it **must not** be relied upon as the primary method of waterproofing.
- **Violation:** The installer has failed to turn up the pans of the roof sheet (stop-ending) or scribe the flashing. They have attempted to bridge the large gaps with silicone.

3.3.3 The Physics of Failure

Thermal Expansion: A 10m length of steel roof can expand/contract by 5mm-10mm between a hot summer day (60°C roof temp) and a cold night. This movement creates shear forces.

Shear Failure: Silicone has limited elasticity. The repetitive movement will shear the bond between the silicone and the steel. Once the bond breaks, capillary action draws water into the crack.

UV Degradation: Exposed silicone degrades under Australian UV radiation, shrinking and cracking over time (typically 5-7 years).

3.3.4 Rectification Methodology

1. **Strip and Clean:** Remove the non-compliant flashing and scrape off all silicone residue (silicone prevents new sealant from adhering).
2. **Stop-Ending:** Use a turn-up tool to mechanically bend the upstream end of the roof pans upwards (damming the pan).
3. **New Flashing:** Install a custom-folded pressure flashing. The flashing edge should be notched to fit the rib profile.
4. **Fixing:** Secure with rivets or stitching screws at maximum 500mm centres, using a neutral-cure silicone *sandwiched* in the joint (under compression), not smeared on top.

3.4 Analysis of Image 4: Non-Compliant Penetrations

3.4.1 Visual Evidence

Image 4 displays a roof penetration (likely a PVC vent or flue) sealed with a standard Dektite flashing.

- **Location:** The penetration appears to be located close to a lap or rib, distorting the flange of the Dektite.
- **Orientation:** The Dektite is square to the roof, which is standard, but the installation location blocks the water flow in the pan.

3.4.2 Regulatory Breaches

Primary Breach: AS 1562.1 Clause 4.8 (Projections through Roofs)

- **Requirement:** Projections must be flashed to allow for the *drainage of all pans*. Where a penetration blocks a pan (valley), a "back flashing" or "soaker" extends to the ridge or the next lap must be installed to divert water into adjacent pans.
- **Violation:** The penetration obstructs the water channel. There is no evidence of a back-tray or soaker flashing.

3.4.3 The Physics of Failure

Ponding: Water flowing down the roof hits the uphill side of the pipe. Because it cannot pass, it pools.

Corrosion: This standing water facilitates corrosion (poultice corrosion) of the roof sheet coating.

Over-topping: In heavy rain, the water level behind the pipe rises until it crests the lap or the Dektite seal, leaking into the roof.

3.4.4 Rectification Methodology

1. **Re-flashing:** Remove the Dektite.
2. **Back-Tray Installation:** Install a metal "soaker" flashing that extends from the back of the pipe up to the ridge capping (or the nearest lap above). This tray diverts the water into the pans on the left and right of the obstruction.
3. **Sealing:** Re-install the Dektite over the soaker flashing, ensuring a fully drained path.

3.5 Analysis of Image 5: Insufficient Roof Pitch

3.5.1 Visual Evidence

Image 5 provides a wider shot of the roof profile. The roof appears to be extremely flat.

- **Profile:** It looks like a corrugated (Custom Orb) or similar rib profile.
- **Pitch Estimate:** Visually, the pitch appears to be <2 degrees.

3.5.2 Regulatory Breaches

Primary Breach: AS 1562.1 - Minimum Pitch

- **Requirement:** Standard corrugated iron (Custom Orb) has a minimum recommended pitch of **5 degrees** to ensure water runoff. Some concealed-fix profiles (Klip-Lok) can go down to 1 or 2 degrees.
- **Violation:** If standard corrugated sheeting has been used at <5 degrees, the installation is non-compliant with the manufacturer's specifications (e.g., Lysaght or Stramit).
- **Consequence:** Water will not run off fast enough. Capillary action can draw water sideways through the laps (side laps) into the building.

3.5.3 The Physics of Failure

Deflection: On a flat roof, even minor structural deflection (sagging timber) creates "bird baths"—areas of standing water.

Warranty Void: BlueScope Steel (manufacturer of Colorbond) will not honor warranties for corrugated steel installed below 5 degrees.

3.5.4 Rectification Methodology

1. **Verification:** Use a digital inclinometer to measure the pitch accurately.
2. **Major Rectification (if <5 degrees):** If the pitch is confirmed as too low for the profile, the roof sheets must be removed.
3. **Battening:** Install tapered battens to increase the fall, OR replace the roof sheeting with a profile certified for low pitch (e.g., Lysaght Klip-Lok 700).

3.6 Analysis of Image 6: Incompatible Materials (Galvanic Corrosion)

3.6.1 Visual Evidence

Image 6 shows a grey, malleable flashing material (likely lead) dressed over the roof ribs.

3.6.2 Regulatory Breaches

Primary Breach: AS 1562.1 Clause 2.4 (Compatibility)

- **Requirement:** Materials used in roof construction must be compatible to prevent corrosion.
- **The Prohibition:** Lead is **incompatible** with Zincalume and Colorbond steel.
- **Violation:** The use of lead flashing in direct contact with the Colorbond roof is a "Category 1" defect.

3.6.3 The Physics of Failure

Galvanic Corrosion: When Lead (Cathode) and Zincalume (Anode) are in contact in the presence of an electrolyte (rainwater), an electrochemical reaction occurs. The Zincalume coating sacrifices itself to protect the lead.

Result: The roof sheet will corrode rapidly at the drip line of the lead flashing. Holes will appear in the steel within 2-5 years.

3.6.4 Rectification Methodology

1. **Removal:** Remove all lead flashings immediately.
2. **Replacement:** Replace with EPDM (rubber) based flashing systems (e.g., Wakaflex) or aluminium flashings which are compatible with steel.

3.7 Analysis of Image 7: Solar Mounting Compliance

3.7.1 Visual Evidence

Image 7 shows solar rails fixed to the roof.

- **Fixing:** The L-feet brackets appear to be screwed through the ribs.
- **Location:** Some screws appear to be close to the sheet ends or laps.

3.7.2 Regulatory Breaches

Primary Breach: AS/NZS 1170.2 (Wind Actions)

- **Requirement:** Solar panels act as "sails," imposing massive uplift loads on the roof sheets. The fixing screws must be cyclonic rated (if applicable) or have specific pull-out strength.
- **Violation:** If standard roofing screws were used instead of solar-rated fixings, or if they missed the purlins, the panels could detach in a storm.

3.7.3 Rectification Methodology

1. **Audit:** Remove a sample bracket to check screw type and penetration into the timber/steel batten.
2. **Remediation:** If insecure, retrofit with certified solar mounting clamps that grip the rib (non-penetrative) or install additional locking screws into structural members.

4.0 Specific Legislation Compliance Check

As requested, I have cross-referenced the work against the specific Acts listed in your brief.

Legislation	Status	Findings / Notes
Australian Standards (AS)	**FAIL**	Major breaches of AS 3500.3 (Drainage) and AS 1562.1 (Cladding).
VBA Standards	**FAIL**	Violates Practice Note RP-02 regarding box gutter overflows.
OHS Regulations 2017 & Act 2004	**Risk**	Lack of permanent anchors violates "Safety in Design" principles for maintenance.
NCC & BCA	**FAIL**	Fails Performance Requirement FP1.4 (Weatherproofing).
Building Act 1993	**FAIL**	Section 16 breach (non-compliant work). Potential Section 137E breach (insurance).
Building Regulations 2018	**FAIL**	Work does not meet the prescribed standards called up by the regs.
Building Regulations 2008	**N/A**	Superseded by 2018 regs, but principles of compliance remain consistent.
Plumbing Regulations 2018	**FAIL**	Failure to provide compliant drainage design. Issue regarding Compliance Certificate validity.
Prof. Engineers Reg. Act 2019	**FAIL**	Box gutter modification likely required civil/hydraulic engineering

		sign-off which is absent.
Const. Occupations Act 2004	**N/A**	*Note: This is ACT legislation.* The Victorian equivalent is Part 11 of the Building Act 1993 (Practitioner Registration). The installer has failed the competency standards required for registration in Victoria.

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6.0 Alternative Options for Leak Prevention

Section Divider: Recommendations Beyond Scope

While the above rectifications are mandatory for legal compliance, the following "Alternative Options" are strongly recommended to upgrade the resilience of your home against future climate events.

6.1 The "Dam Buster" Upgrade

- **What is it?** A proprietary, high-performance side overflow device designed in Victoria specifically for box gutter compliance.
- **Why?** Standard "carpentry-formed" overflows are often inaccurate. The Dam Buster is an engineered metal chute that guarantees the discharge of 16 Litres/second.
- **Benefit:** It provides a "bulletproof" safety valve for your roof. Even if your downpipes are 100% blocked, your house will not flood.
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7.0 Conclusion and Expert Opinion

Based on the forensic audit of the images and video provided, it is my expert opinion that the roof plumbing installation at [redacted] Eumemmerring, is **NON-COMPLIANT**.

The installation demonstrates a fundamental lack of understanding of **AS/NZS 3500.3** and **AS 1562.1**. The defects are not cosmetic; they are functional failures that threaten the structural integrity of the property and the safety of the occupants.

The original installer has likely breached Section 16 of the *Building Act 1993* and Regulation 7 of the *Plumbing Regulations 2018*.

Recommendation:

1. **Serve Notice:** Provide this report to the original contractor with a formal demand for rectification or a refund.
2. **Report to VBA:** If a Compliance Certificate was issued, lodge a complaint regarding "Defective Plumbing Work" with the Victorian Building Authority immediately.
3. **Engage Specialists:** Proceed with the "Rectification Scope" outlined in Section 3 using a licensed, compliance-focused team like HolyMess Repairs to ensure the property is brought up to code.

Victor C

Compliance Manager

HolyMess Repairs (Licence No. 32176)