NATIONAL CONSTRUCTION CODE

2019 SEMINAR ROADSHOW

PLUMBING

VICTORIAN BUILDING AUTHORITY
BUILDING CONFIDENCE
Welcome
Today’s Topics

1. Plumbing Regulatory Framework
2. Changes to the Plumbing Code of Australia (PCA) 2019
3. Energy Safe Victoria – Gas installations and appliances update
4. BREAK
5. Developing performance solutions
6. Plumbing modification changes
7. Common issues seen during plumbing audits
8. Plumbing investigations update
The Plumbing Regulatory Framework
Building Act 1993

• Governs building and plumbing activity in Victoria
• Purpose of the Act is health and safety
• Part 12A of the Building Act covers plumbing work
Plumbing Regulations 2018

- Classes of plumbing work
- Scopes of work
- Qualification and experience requirements
- Adopts the Plumbing Code of Australia (PCA)
- Sets standards of work
Changes to the Plumbing Code of Australia (PCA) 2019
Main changes to the PCA 2019

Sections reorganised:
- Cross-connection
- Rainwater harvesting
- Excessive noise
- Accessible facilities

Sections relocated to Victorian appendix:
- Stormwater
- HVAC
- Low risk, on-site liquid trade waste

New requirements:
- Heated water services
- Cross-connection control
- Excessive noise
- Evaporative cooler

Standards added:
- Fire-fighting water services
- HVAC

Standards deleted:
- Domestic installation Part 5
Sections reorganised in the PCA

New sections:

• Cross-connection
• Rainwater harvesting and use
• Excessive noise
• Accessible facilities
Sections relocated to Victorian Appendix

- Stormwater drainage systems
- Heating, ventilation and air-conditioning systems
- Low risk, on-site liquid trade waste systems
New Requirements

• Heated water services
• Cross-connection control
• Excessive noise
• Heating, ventilation and air-conditioning systems
• Clarification of stormwater roofing requirements
Heated water services

- New requirements to limit water temperature to 45°C for disabled facilities
45°C hot water tempering currently required in: healthcare, aged-care, childcare and school buildings

Sanitary fixtures for the aged, sick, children or people with disabilities
45°C hot water tempering now also required in designated accessible facilities in common areas of Class 2 Buildings.
45°C hot water tempering now required in designated accessible facilities in all other buildings, except for houses or units.
45°C hot water tempering now required in designated accessible facilities in all other buildings, except for houses or units.
Meeting the 45°C hot water tempering requirements

To limit water to 45°C you must use:

- 🔄 Thermostatic mixing valve (TMV)
- 🔄 Thermostatically controlled tap

You must not use:

- ✗ Tempering valve
New Requirements

- Heated water services
- Cross-connection control
- Excessive noise
- Heating, ventilation and air-conditioning systems
- Clarification of stormwater roofing requirements
Cross-connection control

- The PCA now lists cross-connection hazard ratings for common fixtures and appliances.
Cross-connection control
New Requirements

• Heated water services
• Cross-connection control
• Excessive noise
• Heating, ventilation and air-conditioning systems
• Clarification of stormwater roofing requirements
DP1.1 Undue noise
Plumbing and drainage systems must be designed, constructed and installed in a manner that does not create undue noise.

DP1.2 Excessive noise
Plumbing and drainage systems must be designed to reduce the transmission of airborne and/or impact-generated sound, which may cause illness or loss of amenity to occupants.
Noise requirements for dwellings with a shared wall and multi-unit buildings
For houses that share a separating wall
New noise requirements apply to plumbing in separating walls in Class 1 buildings.
Deemed-to-satisfy noise requirements for Class 1 buildings

1. Separating wall must have a cavity at least 20 mm wide.

2. Minimum 10 mm gap between plumbing and neighbour’s side of wall cavity.

3. Plumbing not fixed to neighbour’s side of wall.

4. Pipework must not be chased in if the wall is concrete or brick.
Deemed-to-satisfy noise requirements for Class 1 buildings

1. Separating wall must have a cavity at least 20 mm wide.
2. Minimum 10 mm gap between plumbing and neighbour’s side of wall cavity.

Deemed-to-satisfy noise requirements for Class 1 buildings
Deemed-to-satisfy noise requirements for Class 1 buildings

3. Plumbing not fixed to neighbor’s side of wall
Deemed-to-satisfy noise requirements for Class 1 buildings

4. Pipework must not be chased in if the wall is concrete or brick.
Noise requirements for multi-storey buildings

Plumbing or drainage must be separated from neighbouring units by walls, ceilings or floors with a sound insulation rating of:

a) 40 if the adjacent room is a habitable room (other than a kitchen), or

b) 25 if the adjacent room is a kitchen or a non-habitable room.
Noise requirements for class 2, 3 and 9c buildings -

Separating wall next to habitable room:
Sound rating 40
Noise requirements for class 2, 3 and 9c buildings -

Separating wall next to habitable room:
Sound rating 40

Separating wall next to bedroom or living room
Noise requirements for class 2, 3 and 9c buildings -

Separating wall next to habitable room: Sound rating 40

Separating wall next to bedroom or living room

Pipework for kitchen and bathroom
Noise requirements for class 2, 3 and 9c buildings -

Separating wall next to habitable room:
Sound rating 40

Separating wall next to bedroom or living room:
- Sound rating 40

Wall between pipework and neighbour's bedroom must have a sound insulation rating of at least 40.
Noise requirements for class 2, 3 and 9c buildings

Separating wall next to a non-habitable room:
Sound rating 25
Noise requirements for class 2, 3 and 9c buildings

Separating wall next to a non-habitable room:
Sound rating 25

Wall between pipework and neighbour's bathroom and hallway must have a sound insulation rating of at least 25.
Sound insulation rating of walls found in NCC Volume 1
New Requirements

- Heated water services
- Cross-connection control
- Excessive noise
- Heating, ventilation and air-conditioning systems
- Clarification of stormwater roofing requirements
New standard AS/NZS 5141

• Ducted and non-ducted residential heating and cooling
• Must be used together with other standards for ductwork, piping, gas fitting and refrigerated gas handling
• Found in PCA 2019 – Vic. Section G
Evaporative coolers

- Evaporative coolers may discharge to spreaders over tiled roofs, not metal roofs
- Found in PCA 2019 – Vic. Section G
New Requirements

• Heated water services
• Cross-connection control
• Excessive noise
• Heating, ventilation and air-conditioning systems
• Clarification of stormwater roofing requirements
Gutters and downpipes

For gutters and downpipes in Class 1 buildings:

- All requirements are now found in the PCA
- NCC Volume 2 Part 3.5.2 no longer applies in Victoria
- Maximum 12 m spacing of downpipes is not required
Standards changes
Old standard removed – AS/NZS 3500.5

- AS/NZS 3500.5 is outdated
- It can no longer be used as a deemed-to-satisfy standard
Two new standards for automatic fire sprinklers in Class 2 and 3 buildings
Backflow device

Sprinkler offtake

Drinking water supply

WC

Level 1

Level 2
Where sprinklers are required in Class 2 and 3 residential buildings
Fire sprinklers required for buildings over 25 m tall
Fire sprinkler protection now required for Class 2 and 3 buildings with four or more storeys.
Break
Developing performance solutions
What is a performance solution?
Performance requirements

*Performance requirements* specify the level of performance that all plumbing or drainage solutions must meet.

**Example – Cold water service**

**BP1.2 Design, construction and installation**

(1) A cold water service must ensure the following:
   a) Water is provided at *required* flow rates and pressures for the correct functioning of fixtures and appliances.
   b) Access for maintenance of mechanical components and operational controls.
   c) The system, appliances and devices can be isolated for testing and maintenance.
   d) The efficient use of *drinking water*. 
Meeting performance requirements of the PCA

PERFORMANCE REQUIREMENTS

DEEMED–TO–SATISFY SOLUTION

and/or

PERFORMANCE SOLUTION

e.g. BP1.2 Cold water service – Design, construction and installation

e.g. AS/NZS 3500 series
Key principles of Performance Solutions

• Performance Solutions are pre-planned and completed prior to the installation.

• Organise documentation before commencing work.

• All documentation must be retained for a minimum of 10 years.

• Plumbers are responsible for their performance solutions.

• Check with the relevant building surveyor if your plumbing work deviates from what was approved in the building permit.
Key stages

1. Prepare Performance Solution documentation

2. Carry out installation according to design

3. Describe installation on Compliance Certificate
Key stages

1. Prepare Performance Solution documentation

2. Carry out installation according to design

3. Describe installation on Compliance Certificate
Stage 1: Documentation

1. Prepare Performance Solution documentation
2. Carry out installation according to design
3. Describe installation on Compliance Certificate

Performance Solution Report
- Address/location
- Scope
- Why is it required?
- Type of plumbing work
- Relevant performance requirement(s)
- Method of demonstrating compliance

Test Results and Analysis

Proposed Performance Solution
Stage 1: Documentation

1. Prepare Performance Solution documentation
2. Carry out installation according to design
3. Describe installation on Compliance Certificate

Performance Solution Report
- Address
- Scope
- Why is it required?
- Type of plumbing work
- Relevant performance requirement(s)
- Method of demonstrating compliance
Demonstrating compliance

Test Results and Analysis

Proposed Performance Solution

Performance Solution Report

- Address
- Scope
- Why is it required?
- Type of plumbing work
- Relevant performance requirement(s)
- Method of demonstrating compliance

- A Performance Solution must meet the performance requirements of the PCA or be at least equivalent to the deemed-to-satisfy requirements.

- Use one or more assessment methods:
  1. Certification from a Recognised Expert or Professional Engineer.
  2. Documentary evidence demonstrating that the performance solution meets the relevant requirements of the PCA.
  3. Verification methods prescribed in the PCA.
  4. Compare the performance solution to the deemed-to-satisfy requirements.
Assessment Methods Analysis

Evidence of Suitability

Verification Methods

Expert Judgement

Comparison with the DTS provisions

All Performance Solutions must contain evidence that the solution has been analysed to ensure it will meet the relevant Performance Requirements. Examples of testing methods include:

- Testing on site or in a recognised laboratory
- Computer modelling
- Comparative analysis
- Qualitative or quantitative analysis
- Deterministic or probabilistic analysis

All the Assessment Methods must be carried out by a suitably qualified expert.
Example documentation for a performance solution for eaves gutter overflow provisions

PERFORMANCE SOLUTION REPORT

Address:
733 Bourke Street, Docklands

Scope:
The installation will apply to all eaves gutters installed using ACME gutters and the limitations of the test results.

Purpose:
Building owner wants gutters to be installed against fascia with a smaller gap. This would not meet the 10 mm gap requirement of AS/NZS 3500.3, Appendix G.
Example documentation for a performance solution for eaves gutter overflow provisions

**Type of plumbing work:**
Roofing (Stormwater) work – Eaves gutter overflow provisions.

**Relevant performance requirement(s):**
Plumbing Code of Australia 2019, Vic. Section F
Stormwater drainage systems:
• Vic. FP1.1 Roof drainage systems, and
• Vic. FP1.2 Overflow

**Method of demonstrating compliance (Assessment Method):**
• Certification from a professional engineer.
• Specialist Engineering Pty Ltd was engaged to conduct the research, tests and analysis of ACME gutters to demonstrate their compliance.
Example documentation for a performance solution for eaves gutter overflow provisions

**Proposed performance solution:**
- ACME eaves gutters will be installed in accordance with test report procedures.

**Calculation procedures**
1. Determine the 100-year average recurrence interval for the installation using table X.
2. Determine the maximum ridge to gutter length using table Y.
3. Follow the installation procedures (see section xyz).
4. Calculate the overflow capacity using table Z.
5. Check that calculated overflow capacity is equal to or greater than required overflow capacity specified in section xyz.

**Limitations**
1. Maximum spacing of gutter clips is 1000mm.
2. Roof membranes terminate above gutter back.
Example documentation for a performance solution for eaves gutter overflow provisions

Performance Solution Report

- Address
- Scope
- Why is it required?
- Type of plumbing work
- Relevant performance requirement(s)
- Method of demonstrating compliance

Proposed performance solution

Test Results and Analysis
Stage 2 – Carry out work according to design

1. Prepare Performance Solution documentation

2. Carry out installation according to design

3. Describe installation on Compliance Certificate
Stage 3 – Describe the installation on a compliance certificate

1. Prepare Performance Solution documentation
2. Carry out installation according to design
3. Describe installation on Compliance Certificate
Compliance certificates

- Compliance certificates must identify the performance solution when used.
- Option to use the attachment function in VBA360 to supply all relevant documentation.
- Documentation must be retained for at least 10 years.
Compliance certificate installation details

**installation details**

Eaves gutter overflow provisions have been carried out under a Performance Solution to meet Performance Requirements in Vic. Section F Stormwater drainage systems: Vic. FP1.1 – Roof drainage Systems, and Vic. FP1.2 – Overflow using the certification from a professional engineer assessment method of the Plumbing Code of Australia 2019.

**appliance/product information**

ACME Gutters model xyz

What work does the performance solution apply to? i.e. What is its scope?

The relevant performance requirement(s)

The assessment method used

The version of the PCA used

Example only
Insurance

• Make sure your plumbing insurance covers any performance solution work you carry out.
• If in doubt, check with your insurer!
Additional Resources

- ABCB’s guidance material covering Performance Solutions, including examples.
- Check out the VBA Performance Solution video on the VBA website.
- Call the VBA’s Technical Advice Line on 1300 815 127.
Plumbing Modification Changes
Changes to the Plumbing Regulations 2018

- Plumbing modification application previously required when it was not technically possible to meet the requirements of AS/NZS 3500.2 Clause 3.2 – Location of drains.

- Modification applications now not required if you follow the prescribed requirements in the Plumbing Regulations 2018.
Installations that comply with the new requirements
Common plumbing audit issues
Plumbing Audit Statistics

<table>
<thead>
<tr>
<th>Compliance Certificate Audits</th>
<th>Feb-19 No.</th>
<th>FY18-19 YTD No.</th>
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</thead>
<tbody>
<tr>
<td>Compliance Certificates Audited</td>
<td>1,035</td>
<td>7,228</td>
</tr>
<tr>
<td>Audits Failed</td>
<td>129</td>
<td>1,407</td>
</tr>
<tr>
<td>Percentage of Failed Audits</td>
<td>12%</td>
<td>19%</td>
</tr>
<tr>
<td>Re-Audits Conducted</td>
<td>166</td>
<td>1,657</td>
</tr>
<tr>
<td>No Access</td>
<td>100</td>
<td>566</td>
</tr>
</tbody>
</table>
**Plumbing Audit Statistics**

<table>
<thead>
<tr>
<th>Top 3 causes of audit failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Failing to provide the minimum clearance between the highest part of the burner and the rangehood or exhaust fan.</td>
</tr>
<tr>
<td>2. Failing to install appropriate overflow provisions to eaves gutters.</td>
</tr>
<tr>
<td>3. Failing to install appropriately marked, toughened safety glass splashbacks behind gas burners and cooktops.</td>
</tr>
</tbody>
</table>
Rainheads – Common issues

- Incorrect overflow
- Incorrect discharge
- Incorrect height

Overflow provisions not adequate
Rainhead requirements

- 5.3.1 Overflow provisions and sizing (SA HB 39 Installation Code for metal roof and wall cladding)

- Height of the overflow weir of any rainhead must be at least 25mm lower than the sole of the box gutter
Gas appliance commissioning and spillage tests

Common issues:

- Gasfitters not following gas appliance commissioning procedures.
- Not carrying out negative pressure and/or carbon monoxide spillage tests.
- Use AS/NZS 5601.1 for commissioning and Appendix R for spillage testing.
Compliance & Enforcement
Number of VBA investigators = 15
Unregistered/unlicensed persons carrying out plumbing work

- Section 221D – Plumbing work only to be carried out by registered or licensed plumbers.
- Maximum penalty – $80,595.

Case Example 1:

- Unregistered/unlicensed person doing a rough-in for hot and cold water services in 2016.
- The VBA was notified by the home owner when they became aware the person was not licensed.
- The case went to the Magistrates’ Court in 2018, where the person was fined $4000 plus $1000 for costs.
Obligations on plumbers concerning their agents

• Section 221G – A licensed plumber must not permit a person to carry out on his behalf work in a class that the person is not licensed or registered in.
• Maximum penalty – $8059.50.

Case Example 2:

• An unregistered person was carrying out roofing work under direction.
• The VBA was carrying out registration and licence checks in the area.
• The unregistered person was fined $1,000 plus costs in the Magistrates’ Court.
• The case went to an internal inquiry panel in 2019, where the licensed plumber was fined $806 plus costs.
Case Example 3:

- Non-compliant work due to a solar water heater not being appropriately secured.
- The matter was referred to the Magistrates’ Court, with the plumber fined $2500.
- The defective work was rectified via an insurance claim, as the property owner didn’t want the plumber back on site.
- The offending plumber will also have an insurance claim against his name for the poor workmanship, which is likely to affect his future insurance premiums.
Plumbing work requiring a Compliance Certificate

Section 221E – Restrictions concerning work for which compliance certificate required

1. Unless a person is licensed to carry out a particular class or type of plumbing work or specialised plumbing work, he or she must not carry out any work of that class or type for which a compliance certificate is required.

Case Example 4:
Plumber fined $20,000 with conviction, and ordered to pay costs.
Lodging Complaints

- Visit www.vba.vic.gov.au to lodge complaints in writing via the VBA360 link.
- Attend VBA front counter.
Q&A Session
Contact Us

Victorian Building Authority
Goods Shed North
733 Bourke Street
Docklands VIC 3008

GPO Box 536
Melbourne VIC 3001

1300 815 127

technicalenquiry@vba.vic.gov.au
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