VICTORIAN BUILDING AUTHORITY

PROACTIVE INSPECTIONS PROGRAM

Activity Report

FINANCIAL YEAR 2022-23 Q4

VICTORIA State Government

CONTENTS

ABORIGINAL ACKNOWLEDGEMENT

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

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

ABOUT

The VBA's Proactive Inspections Program (PIP) is an early intervention regulatory initiative which aims to identify non-compliant building and plumbing work under construction and ensures the work is rectified. Our team includes experienced building inspectors, building surveyors and licensed plumbers, who typically inspect more than 1,000 domestic and commercial sites each month. Inspections focus on either building or plumbing work and sites are chosen using a variety of methods. These include::

- Random — identification of building permits lodged with the VBA based on predefined risk-factors, such as buildings intended for human occupation, buildings that are more than two storeys or costs of works.

- Intelligence based — involves targeted inspections of practitioners or sites of interest (based on a variety of information, including risk data) and/or a class of builder/ building surveyor.

- Ad-hoc — inspectors use flexibility to inspect sites that come to their attention while attending other pre-determined sites.

When our inspectors identify compliance risks (potentially non-compliant building and plumbing work), they write to the practitioner, notifying them of the issues that need to be addressed. Once notified, the practitioner responsible (builder, plumber or building surveyor) must respond to the VBA within three days for serious issues and within 14 days for moderate or lower risk issues. Critical life-safety issues must be addressed immediately, and, in these cases, the VBA will telephone the practitioner and relevant building surveyor, as well as notifying co-regulatory agencies such as WorkSafe.

The VBA uses a risk-rating scale (Appendix 1) to determine the level of scrutiny applied to a potential issue. The scale considers the potential adverse effects on the future safety of building occupants, people nearby and on the amenity of the building itself.

In some circumstances, the VBA will issue a Direction to Fix to resolve the most critical issues. For example, where non-compliant wall cladding is identified, the VBA will issue a Direction to Fix requiring the cladding is removed before an occupancy permit is granted.

1.1 MINISTER'S STATEMENT OF EXPECTATIONS

In line with the Minister's Statement of Expectations, the VBA's goal is to inspect 10 per cent of all building permits issued in Victoria each year. This performance measure is currently being reviewed in consideration of VBA's risk-based approach to the regulatory oversight of building and plumbing work.

1.2 BENEFITS

The PIP improves safety and compliance outcomes for building and plumbing work in Victoria through early identification, rectification and, in some cases, by taking other enforcement action. By inspecting work under construction, the VBA can address significant failures earlier, resulting in better outcomes for all involved. At the same time, rectification is often easier and less costly and covered by the practitioner, rather than the owner. Rectification also greatly decreases the possibility of negative impacts on the safety, health and amenity of future occupants, especially when compared to a building where the compliance risk remains undetected or unresolved. Information and intelligence gathered through the PIP enables the VBA to provide advice on building and plumbing standards, as well as education and training for industry.

1.3 HOW WE CONDUCT PROACTIVE INSPECTIONS

Building and plumbing inspectors are provided with comprehensive electronic inspection checklists. The checklists have more than 500 elements grouped into three parts that address:

- building and plumbing work broken down into different building stages under the National Construction Code (NCC) – Volumes 1 and 2 (Building Code of Australia).

- mandatory requirements under the *Building Act 1993*, Building Regulations 2018 and Plumbing Regulations 2018.

- the display of permit information.

- occupational health and safety (OHS) elements, such as working at heights, temporary fencing, adequacy of propping and bracing and working in trenches. If any OHS items present an unacceptable risk, the relevant co-regulators (Environment Protection Authority, WorkSafe or Energy Safe Victoria) are contacted immediately by the building or plumbing inspector.

A comprehensive outline of the electronic inspection checklists is detailed in Appendix 2.

2022–23 QUARTER 4 (Q4) PERFORMANCE

2.1 PERFORMANCE YEAR TO DATE

The graph below illustrates the number of sites inspected each month and demonstrates how the VBA is tracking against the Minister's Statement of Expectations to inspect 10 per cent of new building permits every year.

INSPECTIONS Q4 – APRIL TO JUNE 2023

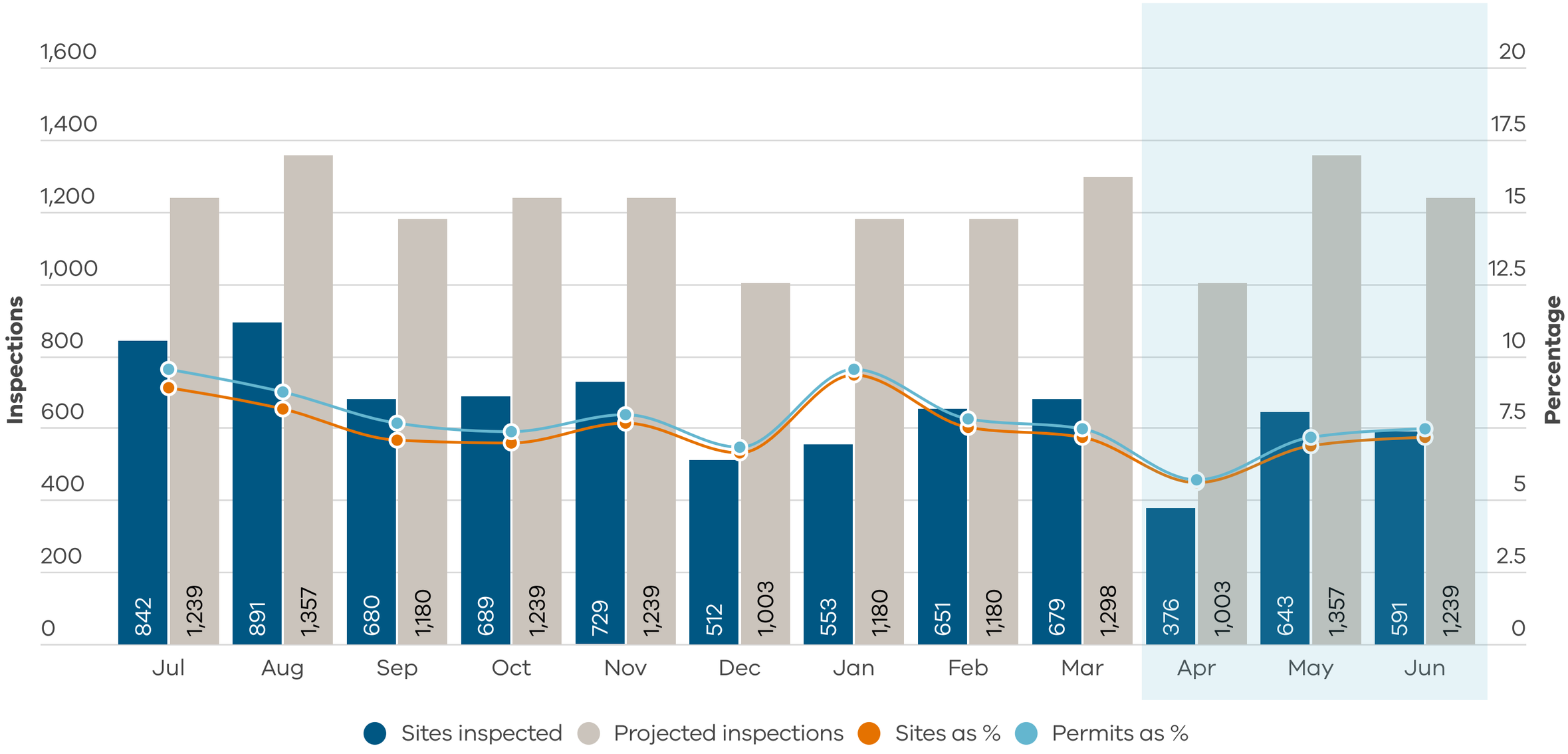


Figure 1: Project inspections, sites as % and permits as % are based on a full financial year forecast of building permit activity across Victoria, as well as historic monthly building permit activity trends. Actual activity is reported from building permit levy data and may vary from projected totals. Discrepancies between projected and completed inspections may occur depending on unforeseen industry activity and resource allocation

TOTAL INSPECTIONS – 2022-23 Q4

927
Plumbing Inspections

683
Building Inspections

A total of 1,610 inspections, comprising of 927 plumbing inspections and 683 building inspections were conducted across 52 Victorian municipalities. These involved 668 builders and 169 building surveyors.

INSPECTION MAP – 2022–23 Q4

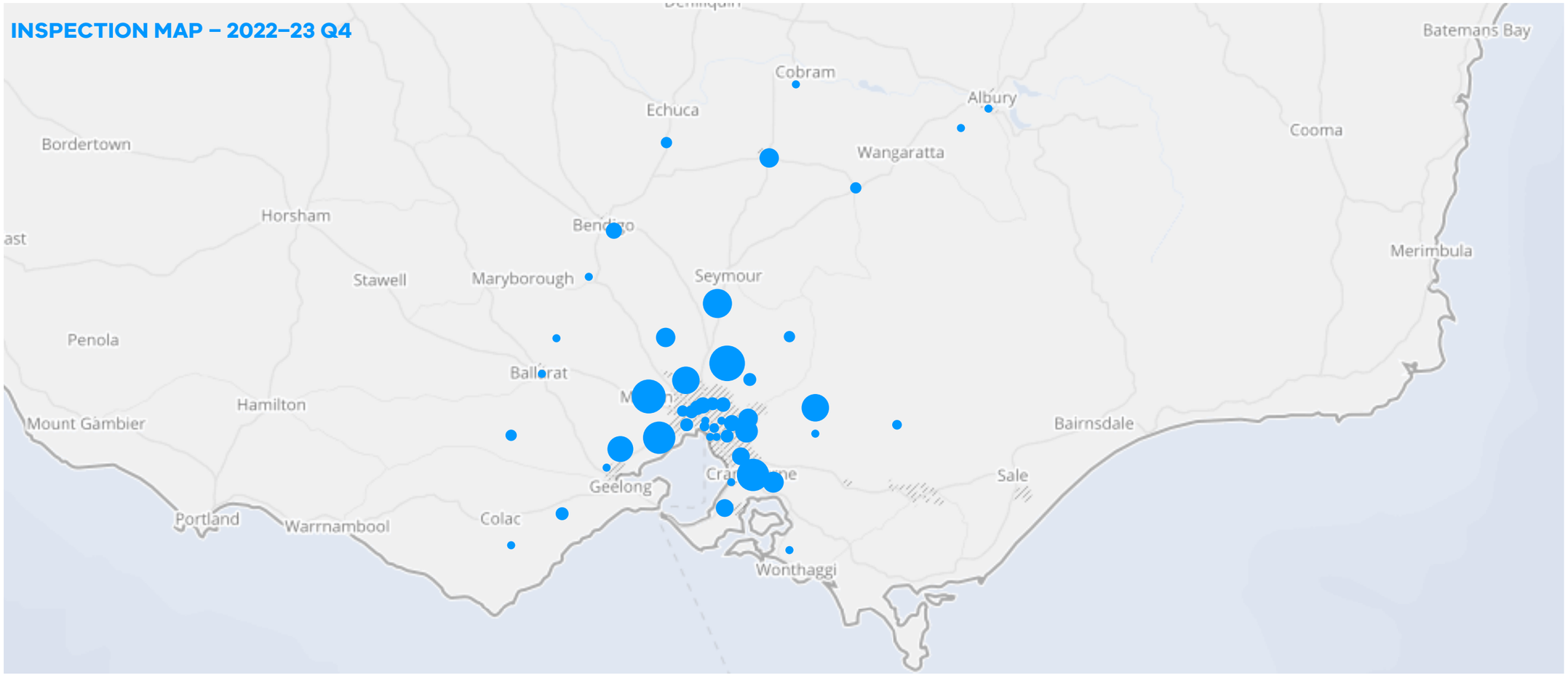


Figure 2: The dots represent the municipalities where inspections occurred. The size of the dots correlates to the number of inspections.
View the interactive map:

NUMBER OF INSPECTIONS AT CONSTRUCTION STAGE 2022–23 Q4

The graphs below illustrate the number of inspections per construction stage throughout the financial year.

BUILDING INSPECTIONS

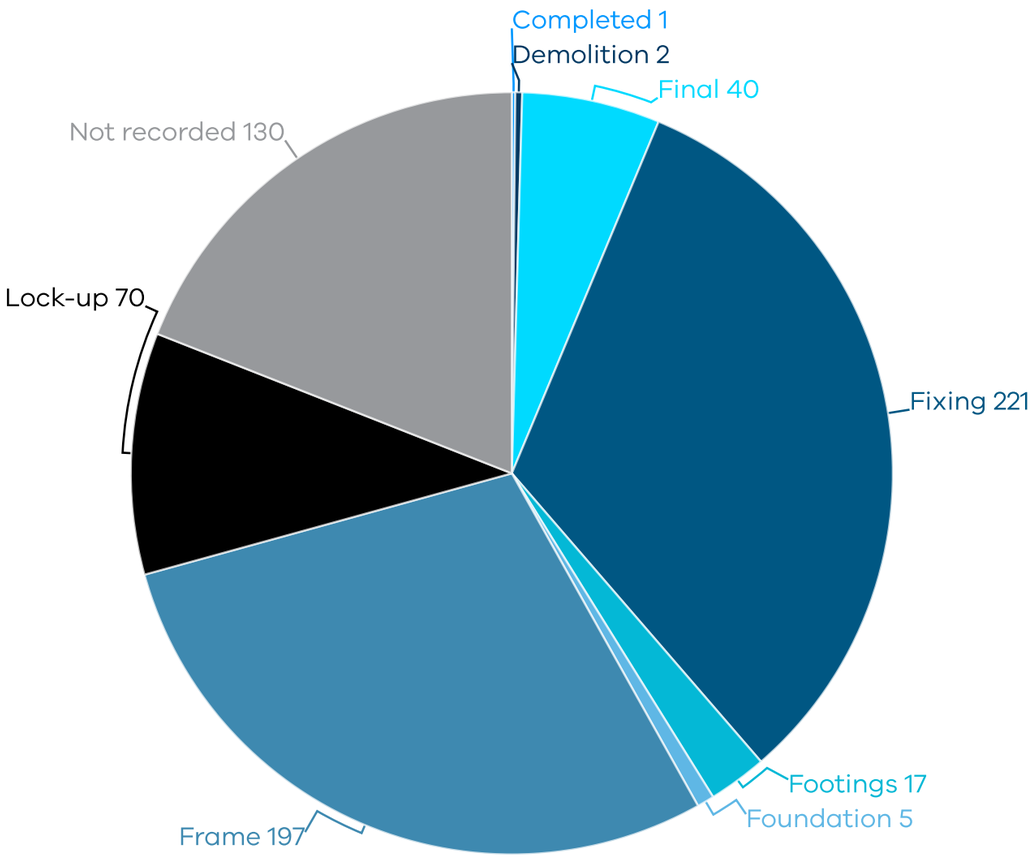


Figure 3: The breakdown of the stages in which proactive building inspections were undertaken.

PLUMBING INSPECTIONS

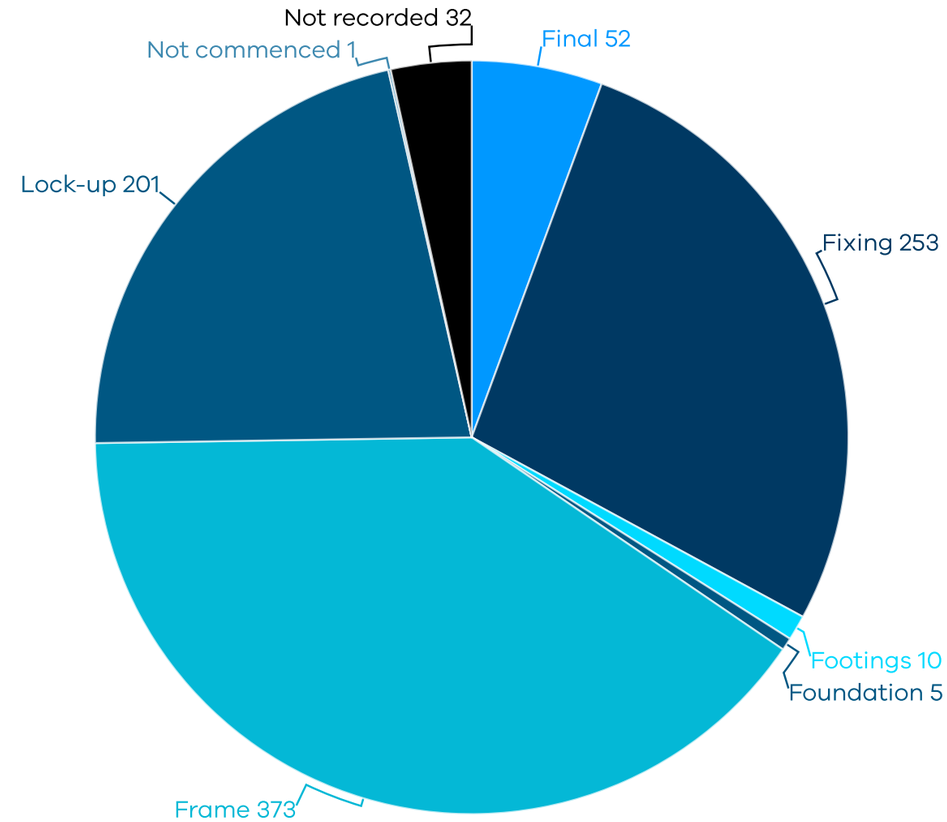


Figure 4: The breakdown of the stages in which proactive plumbing inspections were undertaken.

2.2. WHAT WE FOUND

A total of 623 (39 per cent) inspections conducted during the quarter identified at least one compliance risk which is consistent with the previous quarter's results where 40 per cent compliance risk observed. The decrease in overall compliance risk observed over the past financial year (FY22-23) corresponded with a change in the proportion of plumbing to building inspections undertaken in this year. Historically, proactive inspections have comprised around 60 per cent building and 40 per cent plumbing, however this quarter plumbing accounted for 64 per cent of all inspections. Building inspections typically have a higher prevalence of issues when compared to plumbing inspections.

OBSERVED COMPLIANCE RISK – ALL INSPECTIONS

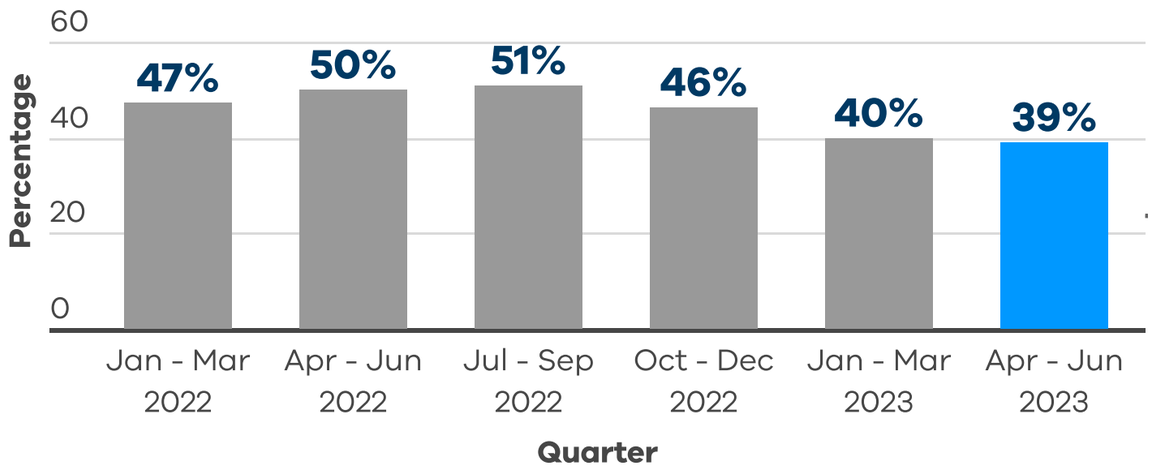


Figure 5: Compliance risks observed during proactive inspections over the past year.

CRITICAL ISSUE

Non-compliant issues of a severity that could result in adverse effects on safety or amenity, financial loss for future occupants or loss of structural integrity if left untreated accounted for one per cent of inspections identified. This rate is lower than previous quarters due to changes made to how OHS issues observed during PIP inspections are reported; from April 2023, OHS issues (typically rated as high-risk) are not reported as PIP non-compliances. Details of the critical issues are outlined in Appendix 3.

A compliance risk is defined as any non-compliant item (observed in a building under construction) which, if not appropriately considered or addressed, has the potential to cause:

- an adverse effect on the safety or amenity of future building occupants and/or the public.
- financial loss for future occupants or loss of structural integrity.

OBSERVED COMPLIANCE RISK – DOMESTIC WORKS

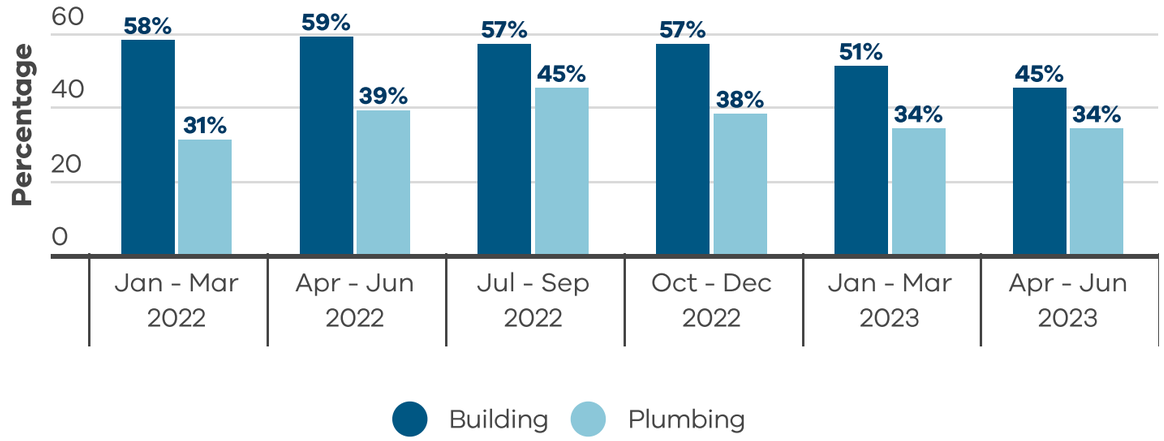


Figure 6: This graph shows the percentage of compliance risks (split between plumbing and building) observed during proactive inspections of domestic works over the past year.

OBSERVED COMPLIANCE RISK – COMMERCIAL WORKS

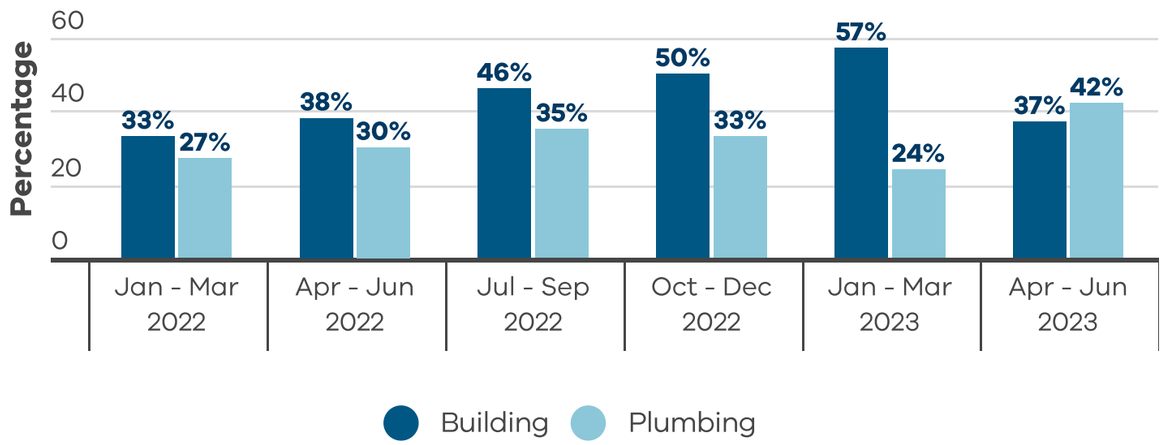


Figure 7: Percentage of compliance risks (split between plumbing and building) observed during proactive inspections of commercial works over the past year.

2.3 ACTIONS TAKEN BY THE VBA IN 2022-23 Q4

The VBA sent 623 notifications to practitioners, requiring them to respond to the compliance risks identified by the PIP. Typically:

- 15 to 18 per cent of notifications sent to practitioners result in them providing all relevant documents, such as an approved performance solution, engineering drawings or certificate of compliance from a registered practitioner, demonstrating how the work meets the requirements of the relevant building legislation. This is because practitioners are not currently required to lodge this documentation with the VBA.
- 1 to 2 per cent of notifications sent to practitioners result in them demonstrating that the work is incomplete rather than non-compliant and will be resolved as the build progresses.
- The remaining notifications of non-compliant work typically require the practitioner to rectify the work and for them to provide the relevant building surveyor (RBS) or the VBA with proof that the work was rectified.

2.4 ENFORCEMENT ACTIVITY

The VBA expects the RBS to manage any required rectifications using their enforcement powers. Typically, a verbal Direction to Fix is issued to the builder. However, depending on the severity and risk of the issue, the RBS may choose to issue a written Direction to Fix or a Building Notice to the builder or owner and notify the VBA.

The VBA monitors all sites that require rectification to ensure the appropriate work is carried out. In exceptional circumstances, the VBA will issue a written Direction to Fix to the builder instead of the RBS. This may occur when the RBS appears to have contributed to the non-compliance or where the issuance of an occupancy permit is imminent, and the VBA wants to ensure the non-compliance is addressed before the property is handed over to the owner.

During this quarter the VBA issued no written Direction to Fix notices.

OBSERVED COMPLIANCE RISK – ALL INSPECTIONS

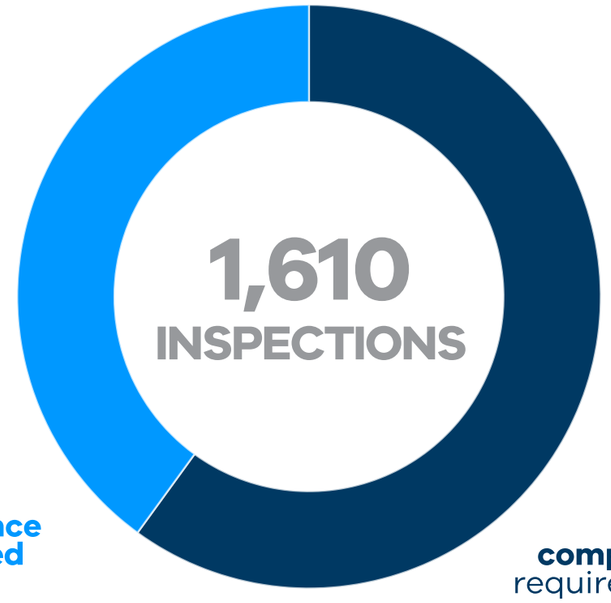


Figure 8: Proactive inspections where at least one compliance risk was identified versus proactive inspections that were compliant or were low risk.

WHO RECEIVES THE NOTIFICATIONS?

The builder and RBS are notified when compliance risks are identified. However, the builder is the primary addressee for potentially non-compliant building work if the elements have not been subject to a mandatory inspection stage. Where elements have been subject to mandatory inspection, the RBS is the primary addressee.

The RBS will also be the primary addressee when the endorsed building permit documentation is considered to lack sufficient information to show compliance for the purposes of the inspection, such as a performance solution, or in situations where the RBS has not considered mandatory items, such as fire separation in dual-occupancy buildings.

The builder is also the primary addressee for potentially non-compliant plumbing work because the plumber is not named in the building permit documents. The VBA relies on the builder to provide the plumber's details. If provided, the VBA will also notify the plumber of any potential issues.

BUILDING INSPECTIONS 2022-23 Q4

3.1. OVERVIEW OF BUILDING INSPECTIONS CONDUCTED 2022–23 Q4

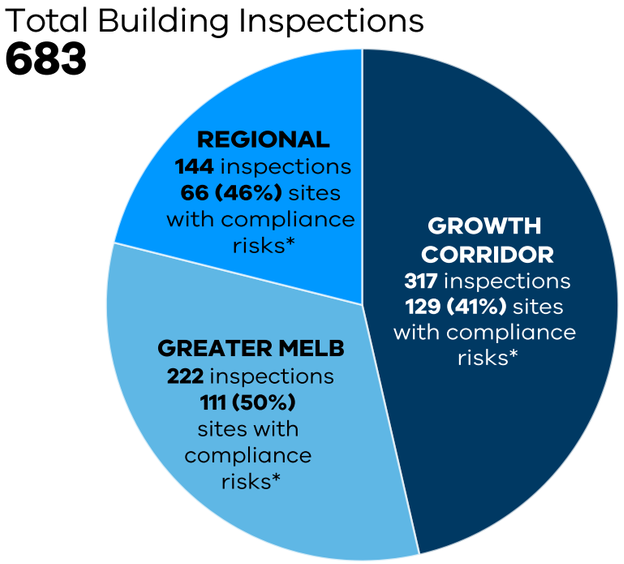


Figure 9: Geographic trends in non-compliance rates observed in proactive inspection of building work in progress.

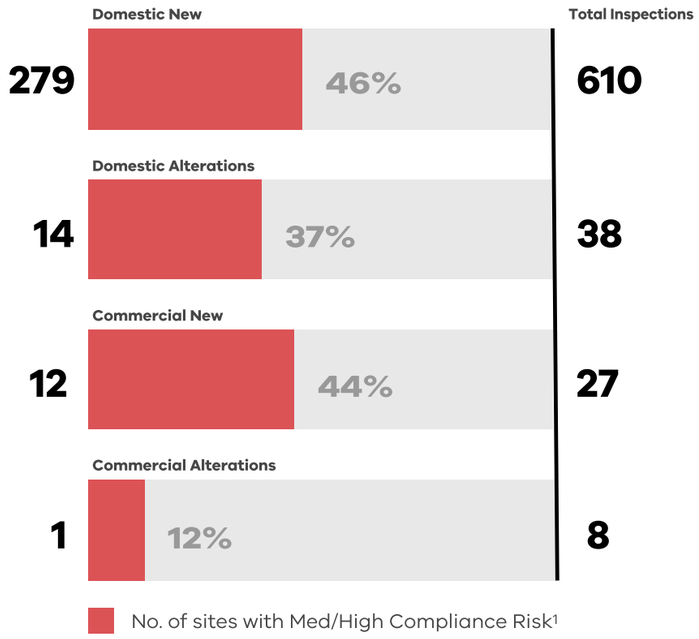


Figure 10: Comparison of non-compliance rates observed in proactive inspection of building work between new builds and alterations.

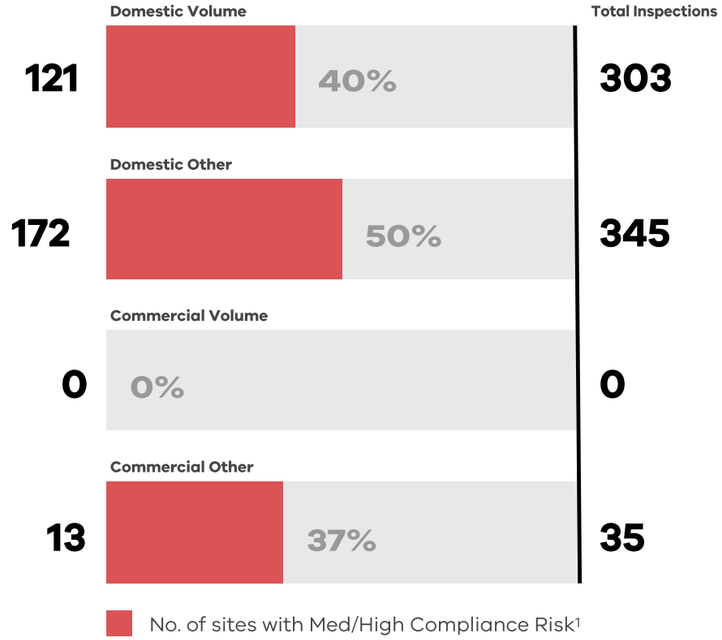


Figure 11: Comparison of non-compliance rates observed in proactive inspections of building work between large volume builders and alterations.

GEOGRAPHIC TRENDS

Volume – Greater Melbourne 'Growth Corridors' had the highest number of inspections undertaken as this is where building permit activity is the greatest.

Inspection outcomes – Prevalence of non-compliant issues observed during building inspections were highest in 'Greater Melbourne'. This trend is consistent with most of the previous quarters reported[2].

NEW BUILDS VS ALTERATIONS

Volume – 'New Builds' had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes – A higher prevalence of non-compliant issues were observed during building inspections of New Builds, in comparison to buildings undergoing 'Alterations.' This trend is consistent with most of the previous quarters reported[2].

VOLUME VS OTHER BUILDERS

Volume – 'Large Volume Builders' proportionately have a higher volume of inspections undertaken because they typically build new dwellings in growth corridors where building activity is the greatest.

Inspection outcomes comparisons – Prevalence of non-compliant issues observed during building inspections were lower in Large Volume Builders. compared to all 'Other Builders.' This trend is consistent with most of the previous quarters reported[2].

The VBA uses trends to update its risk-based site selection. This ensures sites are selected based on the highest risk of adverse effect on the safety and/or amenity of future building occupants and the public.

[1] Number of sites inspected with at least one medium/high compliance risk observed.
[2] Quarterly reporting commenced March 2020.

3.2. OVERVIEW OF WHERE BUILDING COMPLIANCE RISKS ARE FOUND

COMMON NON-COMPLIANCE DOMESTIC - 2022–23 Q4

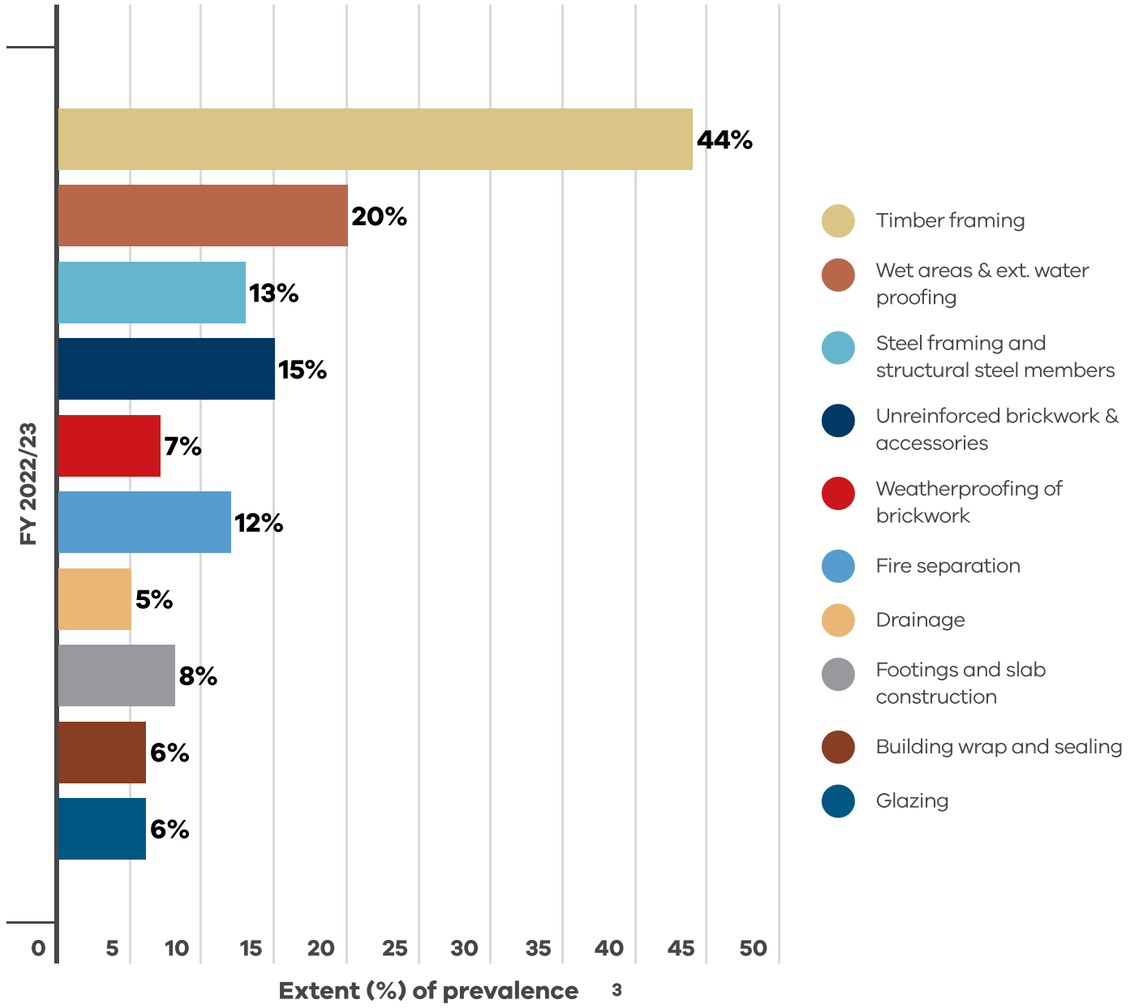


Figure 12: The most prevalent categories where non-compliance risks are observed (medium and high-risk) in proactive inspections of domestic building work in progress.

COMMON NON-COMPLIANCE COMMERCIAL - 2022–23 Q4

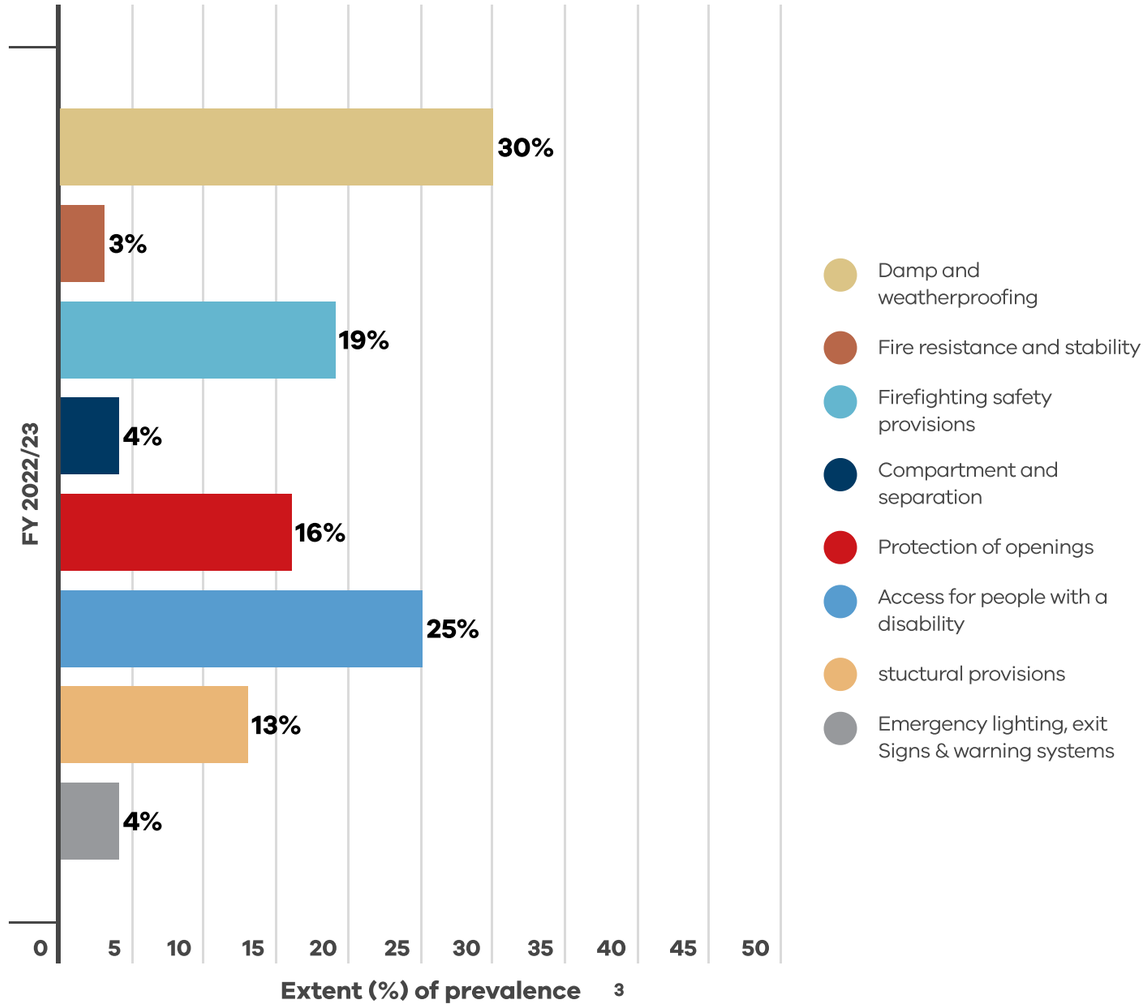


Figure 13: The most prevalent categories where non-compliance risks are observed (medium and high-risk) in proactive inspections of commercial building work in progress.

For more information on the nature of non-compliant issues observed in this quarter go to Section 3.3 ('Overview of Building Compliance Risks').

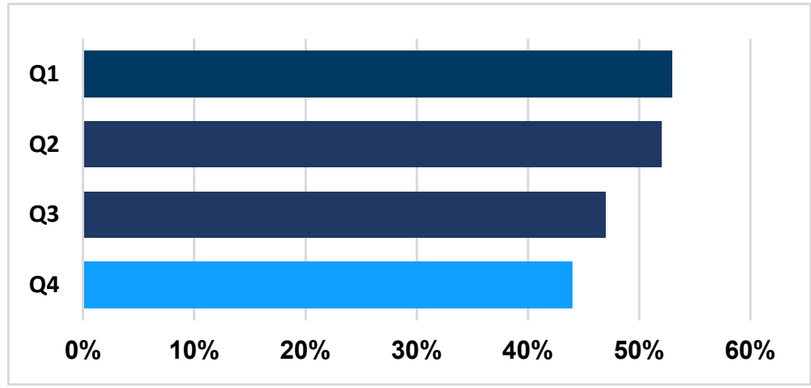
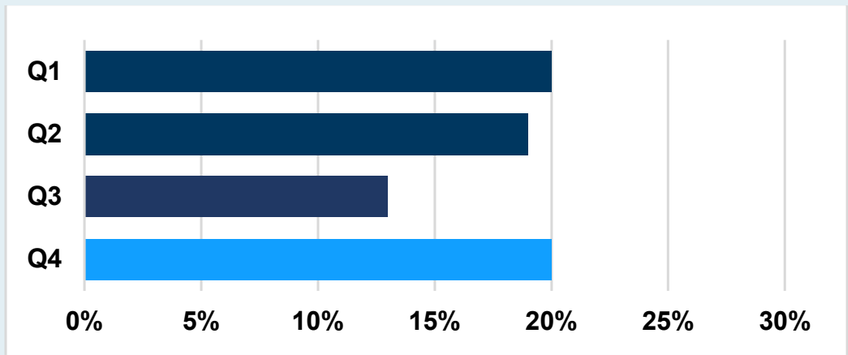
[3.] **Extent (%) of prevalence** is calculated by 'number of times an item was observed as non-compliant over the number of times an item was inspected'.

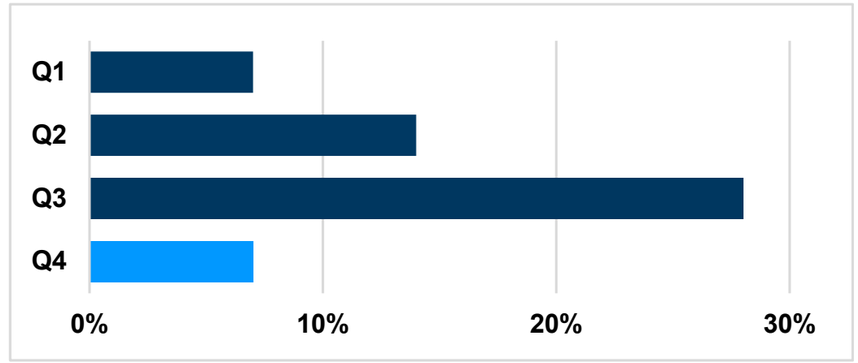
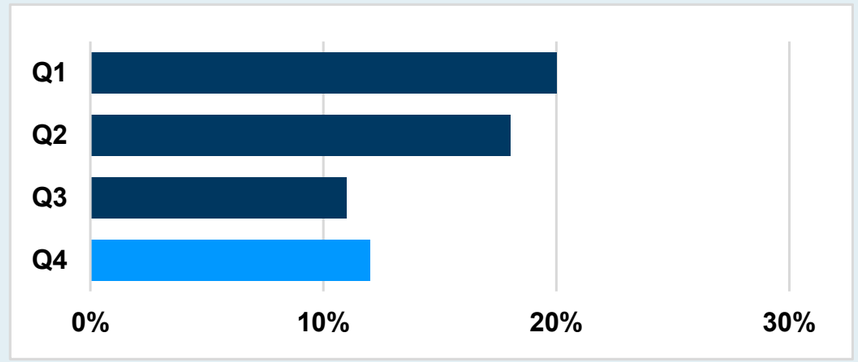
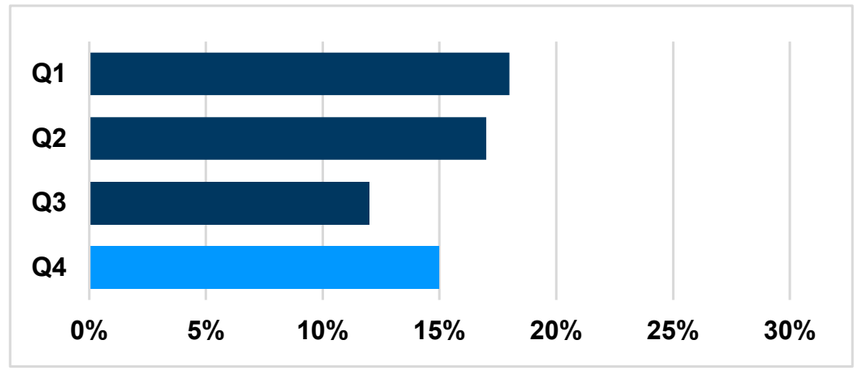
3.3. OVERVIEW OF BUILDING COMPLIANCE RISK DOMESTIC (CLASS 1)

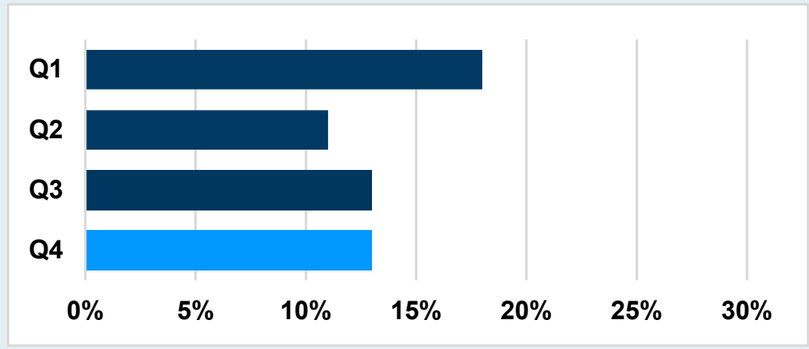
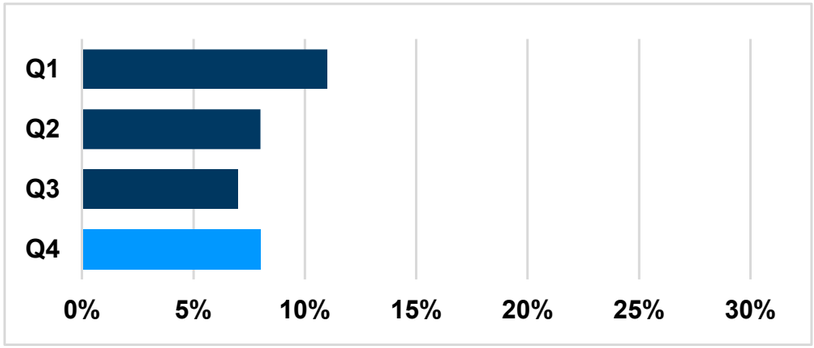
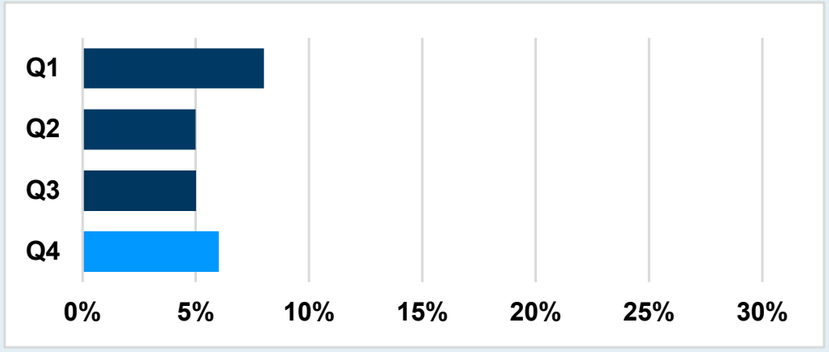
DOMESTIC (CLASS 1)

Approximately **10,000** elements were assessed across **648 domestic building sites** during this quarter (an average of **15 elements** per inspection), of which **579 elements** were identified as a **compliance risk** (across 293 sites) and required rectification or justification. Of these elements **18 were critical** (across 17 sites) and required **immediate attention**.

The most common non-compliances observed within the TOP EIGHT CATEGORIES

Building Category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Timber framing	**149**	• Non-compliant penetrations due to services (mostly plumbing). • Insufficient fixing. For example, nails used instead of hold bolts or failure to use two nails per stud in various items. • Bottom plate overhang >10mm. • Lintels missing from windows and door openings. • Half trusses not braced at ends as per AS4440 - Installation of nail-plated timber roof trusses.	
Wet areas and external water proofing	**56**	• Water stops not installed in wet areas - around bath hob, beneath bath flange, shower enclosures, wet area thresholds and doors, floor junction of wet areas. • Standard plaster board used behind laundry troughs. • Shower/bathroom waterproofing damaged.	

Building Category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Weatherproofing of brickwork	**9**	• Flashings missing around openings or not installed as required by manufacturer. • Damp proof course not extending to full part of walls. • Weep-holes to windows and other openings missing, weep-holes obstructed at garage slab, rendered weep-holes not cleaned out. • Head flashings missing and not installed to brick openings.	
Fire separation	**33**	• Fire separating boundary wall system not installed in accordance with manufacture installation requirements - no silicone along bottom track, no 20mm gap between frame and shaft liner, L clips are placed mid-way, clips not located at every stud, no mineral wool installed at wall junctions, brackets not installed on both sides of separating wall, use of damaged panels, using nails and not screws. • Gaps and holes in fire separation system between dwellings.	
Unreinforced brickwork & accesssories	**69**	• No Lintel over meter box. • Brick ties missing or not attached to studs and expansions ties upside down. • No double row of ties at top of brick wall. • No expansion foam within articulation joints. • No gaps at window where articulation joint is located and required.	

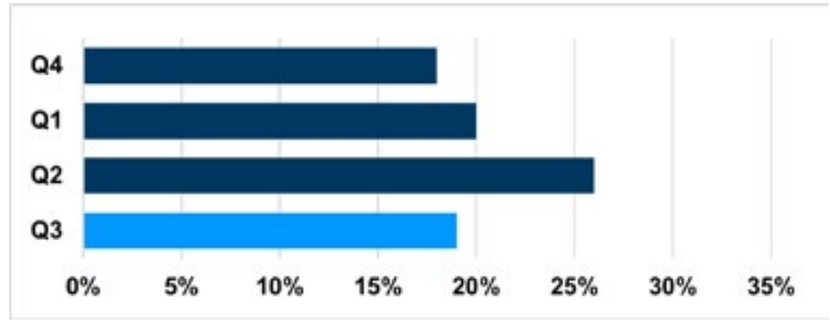
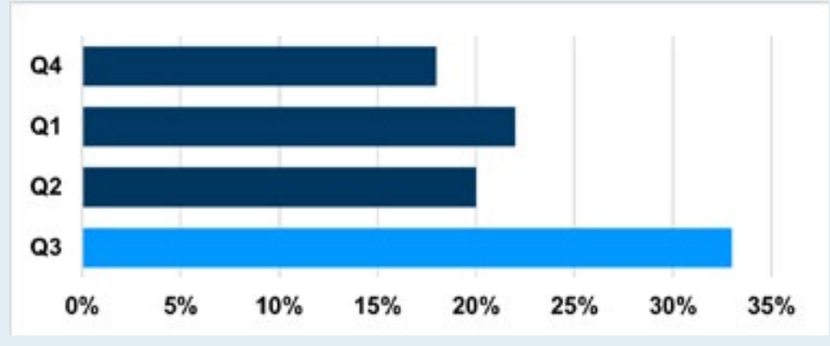
Building Category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Steel framing and structural steel member	**43**	• Lintels not galvanised. • No structural grout under base plate of columns. • Structural integrity - insufficient tightening of bolts at baseplates and steel member connection missing bolts and nuts not tightened to maintain structural integrity.	
Footings and slab construction	**47**	• Brickwork overhang. • Reinforcing steel has exposed in the slab edge. • Slab cut for plumbing services.	
Building wrap and sealing	**20**	• Membrane not fixed to frame. • Discontinuous and incomplete vapour barrier. • Building wrap incomplete (not covering all external walls).	

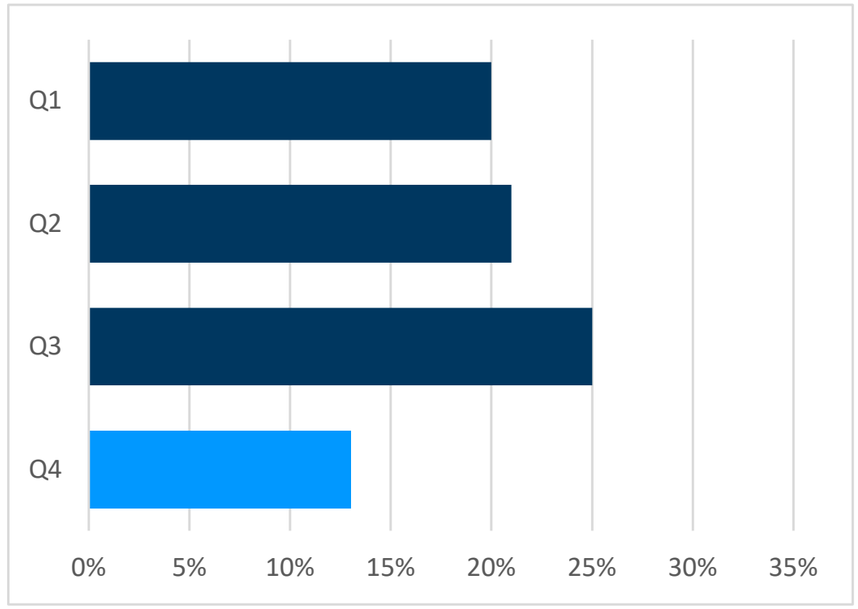
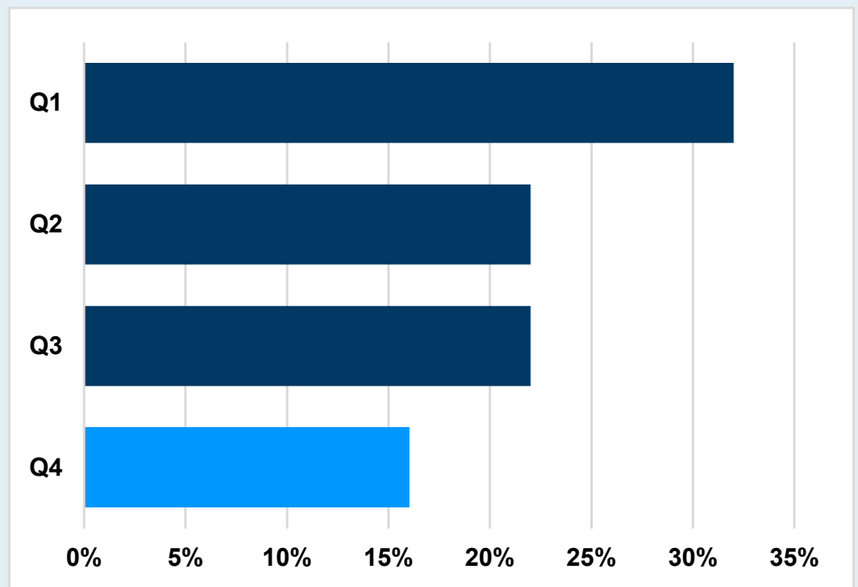
3.3. OVERVIEW OF COMMON NON-COMPLIANT ITEMS OBSERVED

COMMERCIAL (CLASS 2 TO 9)

Approximately **450 elements** were assessed across **35 commercial building sites** during this quarter (an average of 13 elements per inspection) of which 34 elements were identified as a compliance risk (**across 13 sites**) and required rectification or justification. There were no critical issues identified.

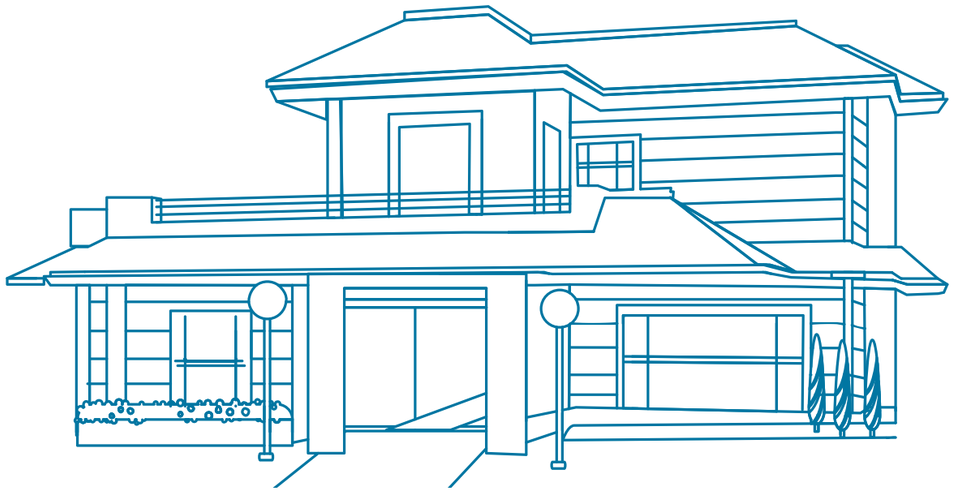
The most common non-compliances observed within the TOP FOUR CATEGORIES

Building category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Fire safety provisions	**12**	• No temporary portable fire extinguishers provided to site or installed to every floor during construction. • Fire isolated exit riser heights are not consistent with a medley of riser dimensions exceeding the allowable 10mm in accordance with BCA Vol 1 Cl D2.13. • Unobstructed width to the landing of the fire isolated stair is less than the allowable, as required in accordance with BCA Vol 1 Cl D1.6.	
Damp and weatherproofing	**6**	• Balcony waterproofing membrane incomplete (the membrane does not extend under the windowsill) and window is without subsill flashing installed. • No overflow provision provided to external balconies.	

Building category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Structural provisions	**6**	• Structural integrity compromised for service openings. • Exposed reinforcement within a fire isolated doorway header that compromised the minimum concrete cover to reinforcement as required by NCC – Volume 2 - Part 3.2.3.	
Protection of openings	**5**	• Penetrations through walls and floors requiring FRL. • Fire door separating the garage from dwelling not self-closing.	

3.4. PREVALENCE OF BUILDING COMPLIANCE RISKS -SINGLE OCCUPANCY VS DUAL OCCUPANCY

SINGLE OCCUPANCY



Common Building Issues

- Timber framing
- Waterproofing and external weatherproofing
- Unreinforced brickwork and accessories
- Steel framing and structural steel
- Footings and slab construction
- Fire separation

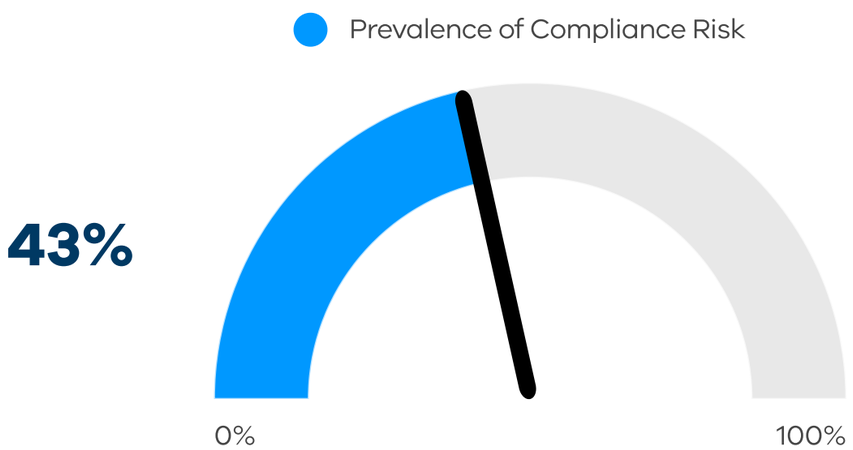
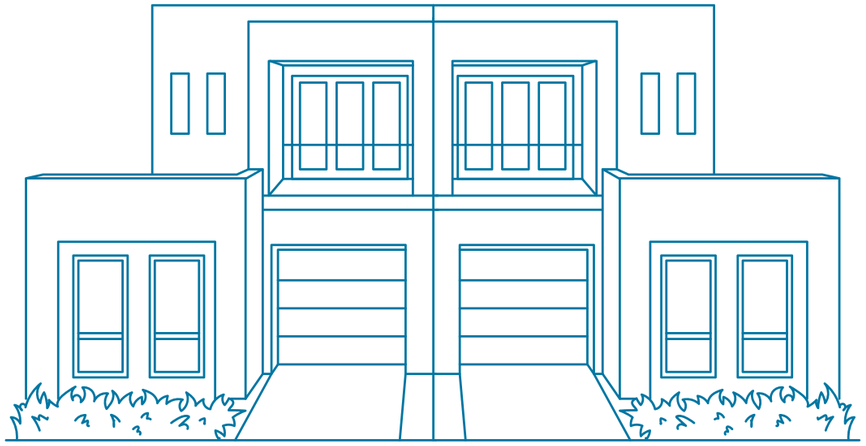


Figure 14: Prevalence of compliance risks observed in proactive building inspections of single occupancy dwellings.

DUAL OCCUPANCY



Common Building Issues

- Fire separation
- Footings and slab construction
- Steel framing and structural steel
- Waterproofing and external weatherproofing
- Timber framing
- Unreinforced brickwork and accessories

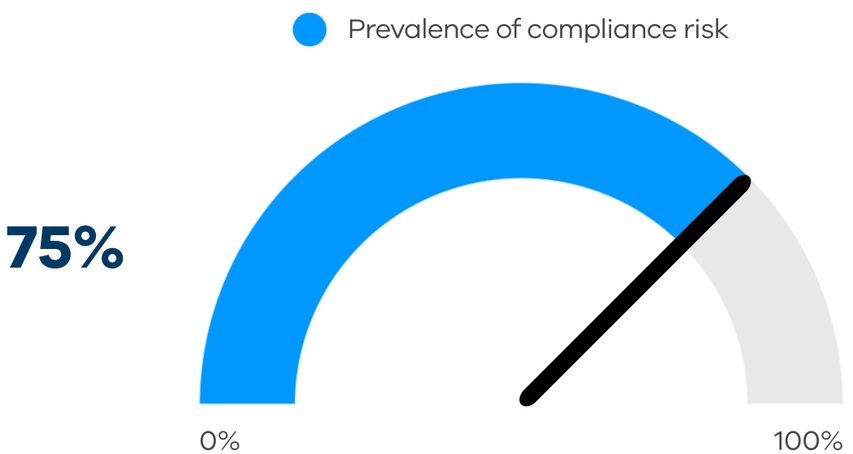


Figure 15: Prevalence of compliance risks observed in proactive building inspections of dual occupancy dwellings.

3.5. PREVALENCE OF BUILDING COMPLIANCE RISKS BY CLASS

Class	No. of sites inspected in Q4	% of compliance risks across class from all inspections	Areas of serious compliance risk for building
Domestic (Class 1 and 10)	**648**	**45%**	• Timber framing • Weatherproofing of masonry • Wet areas and external weatherproofing • Steel framing and structural steel members • Unreinforced brickwork and accessories • Fire separation • Footings and slab construction • Building wrap and sealing • Glazing • Drainage
Apartments ≥2 sole occupancy (Class 2 + mixed use) and group dwellings and hospitals (Classes 3, 4, 9)	**17**	**47%**	• Firefighting equipment • Construction of exits • Damp and weatherproofing • Fire separation
Assembly building with no dwellings (Class 9b)	**6**	**17%**	• Access for people with a disability • Structural provisions • Protection of openings

Class	No. of sites inspected in Q4	% of compliance risks across class from all inspections	Areas of serious compliance risk for building
Office buildings and cafes, shops and markets with no dwellings (Classes 5, 6 + mixed use)	**7**	**29%**	• Protection of openings • Firefighting equipment • Access for people with a disability • Emergency lighting, exit signs and warning systems
Warehouse, factories and carparks – no dwellings (Classes 7a, 7b, 8)	**5**	**40%**	• Structural provisions • Damp and weatherproofing • Compartmentation and Separation • Protection of openings

3.6. CASE STUDY - BUILDING

CONSTRUCTION OF A CLASS 9B ASSEMBLY BUILDING

Overview

A proactive inspection of a new school under construction identified a door opening out to a linkway that did not have an upturn of 50mm or a grate, (the width of the door). This is contrary to the weatherproofing requirements of performance provisions in FP1.4. (of Volume 1 of the BCA and Clause 2.8.3 of AS 4654.2).

Response

A VBA notification to the RBS and builder prompted the RBS to request amendments to the design and building permit to ensure a compliant trench grate to AS 4652.2 is installed.

Outcome

The VBA closed the matter upon receiving the amended building permit documentation. This was a positive result, as it would have been very difficult to fit a grate drain to the linkway once the concrete had been poured.

Example of door opening out to a linkway that did not have an upturn of 50mm or a grate.

CONSTRUCTION OF A CLASS 2 BUILDING

A proactive inspection of a three-storey apartment building, (with lower ground carpark), identified the balconies' waterproofing membranes did not continue under the windowsills and there were no subsill flashings, contrary to FP1.4 of Volume 1 of the BCA/clause 2.8.3 of AS 4654.2.

Response

A VBA notification to the RBS and builder prompted the builder to rectify the incomplete waterproofing membranes. The builder removed the relevant windows and applied an approved (to the relevant standard) waterproofing method under the windows.

Outcome

The VBA closed the matter upon receiving the photographic evidence of the rectification work. This was a positive result, as it avoided the possibility of water ingress issues occurring in the building from poorly waterproofed balconies and impacting the future amenity of the dwellings.

BEFORE

AFTER

PLUMBING INSPECTIONS 2022-23 Q4

4.1. OVERVIEW OF PLUMBING INSPECTIONS CONDUCTED Q4

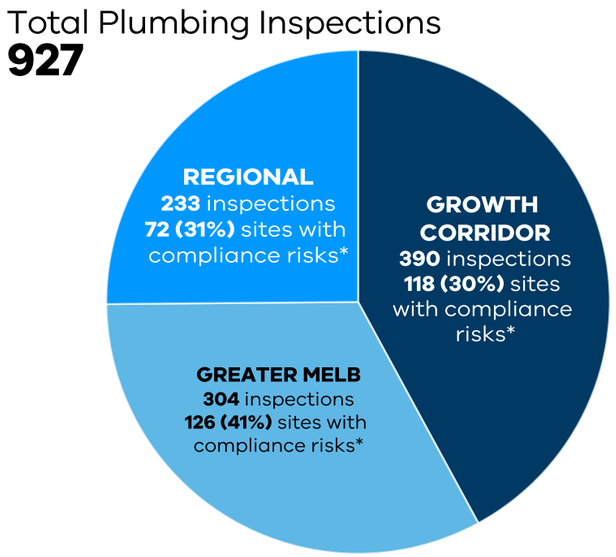


Figure 16: Geographic trends in non-compliance rates observed in proactive inspection of plumbing work in progress.

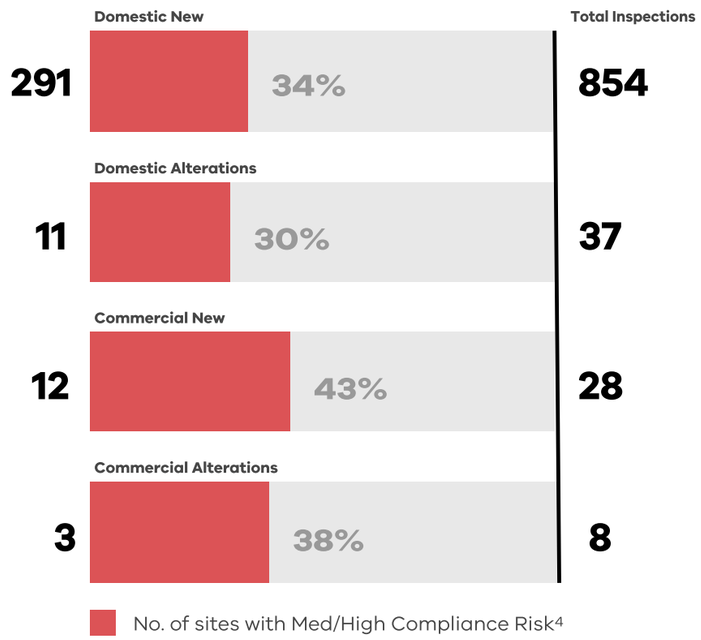


Figure 17: Comparison of non-compliance rates observed in proactive inspections of plumbing work between new builds and alterations.

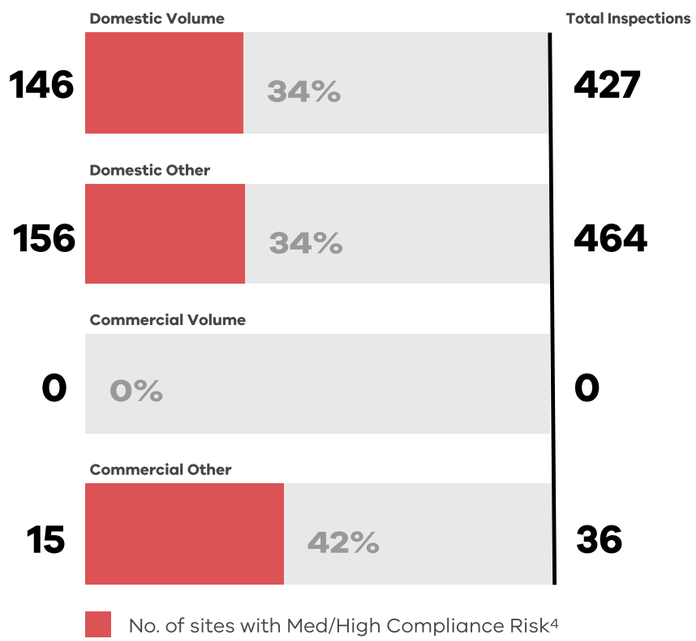


Figure 18: Comparison of non-compliance rates observed in proactive inspections of plumbing work between large volume builders and alterations.

GEOGRAPHIC TRENDS

Volume – Greater Melbourne 'Growth Corridors' had the highest number of inspections undertaken as this is where building permit activity is the greatest.

Inspection outcomes – Prevalence of non-compliant issues observed during plumbing inspections were highest in 'Greater Melbourne'. This trend in compliance risk is not consistent with the previous quarter where 'Regional Victoria' had the highest prevalence of non-compliant issues[5].

NEW BUILDS VS ALTERATIONS

Volume – 'New Builds' had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes – A higher prevalence of non-compliant issues were observed during plumbing inspections of New Builds, in comparison to buildings undergoing 'Alterations.' This trend in compliance risk is consistent with the previous quarter[5].

LARGE VOLUME BUILDERS VS OTHER BUILDERS

Volume – Large Volume Builders proportionately have a higher volume of inspections undertaken because they build a lot of the new dwellings in the growth corridor areas of Melbourne.

Inspection outcomes comparisons – Prevalence of non-compliant issues observed during plumbing inspections were similar across Large Volume Builders compared to all 'Other Builders.' This trend in compliance risk is consistent with the previous quarter[5].

The VBA uses trends to update its risk-based site selection. This ensures sites are selected based on the highest risk of adverse effect on the safety and/or amenity of future building occupants and the public.

[4] Number of sites inspected with at least one medium/high compliance risk observed.
[5] Quarterly reporting commenced March 2020.

4.2. OVERVIEW OF WHERE PLUMBING COMPLIANCE RISKS ARE FOUND

COMMON NON-COMPLIANCE DOMESTIC - 2022–23 Q4

The most prevalent categories where non-compliance risks are observed (excluding low-risk), remain consistent each quarter.

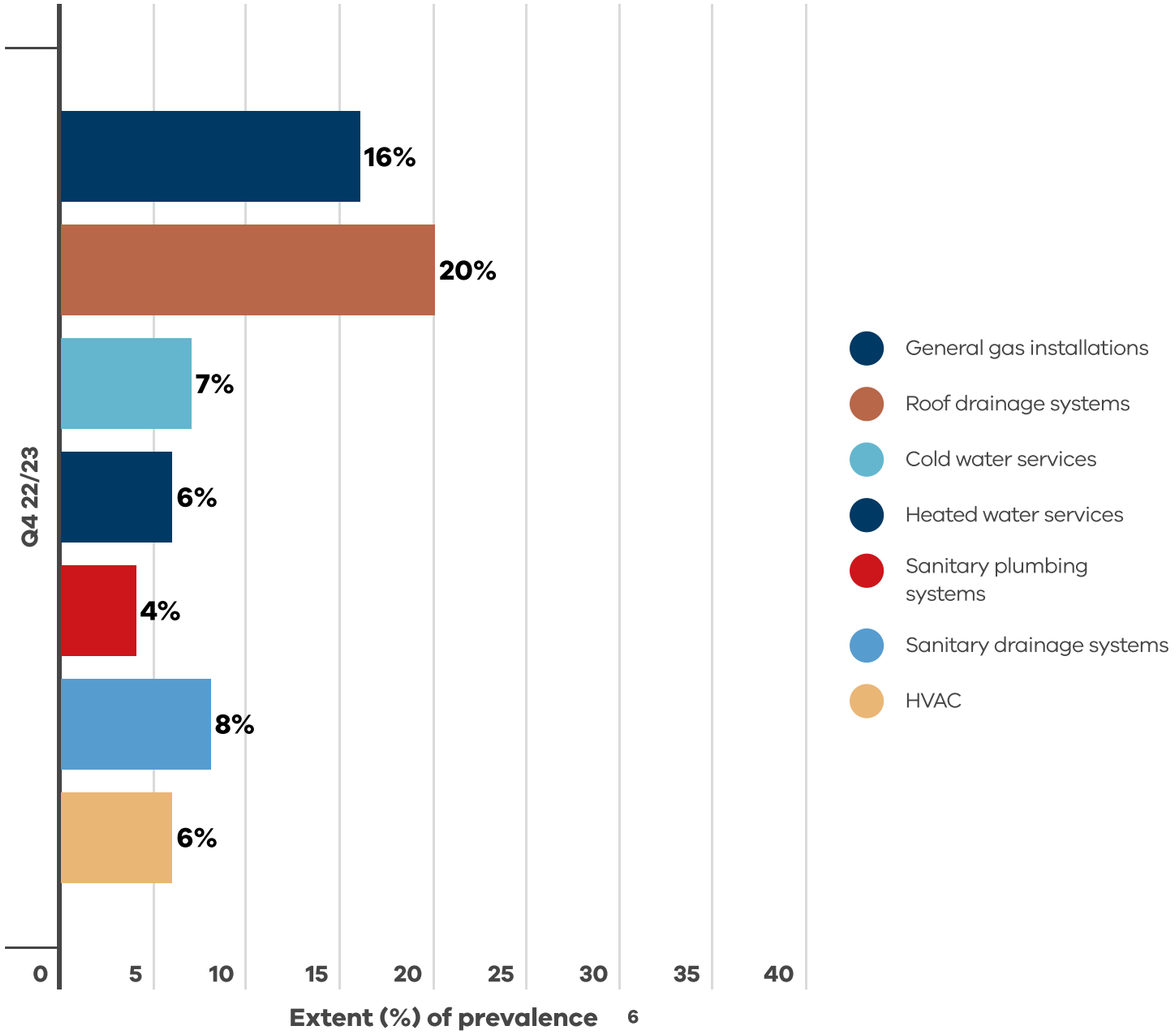


Figure 19: The most prevalent categories where non-compliance risks are observed (medium and high-risk) in proactive inspections of domestic plumbing work in progress.

COMMON NON-COMPLIANCE COMMERCIAL - 2022–23 Q4

The most prevalent categories where non-compliance risks are observed (excluding low-risk), remain consistent each quarter.

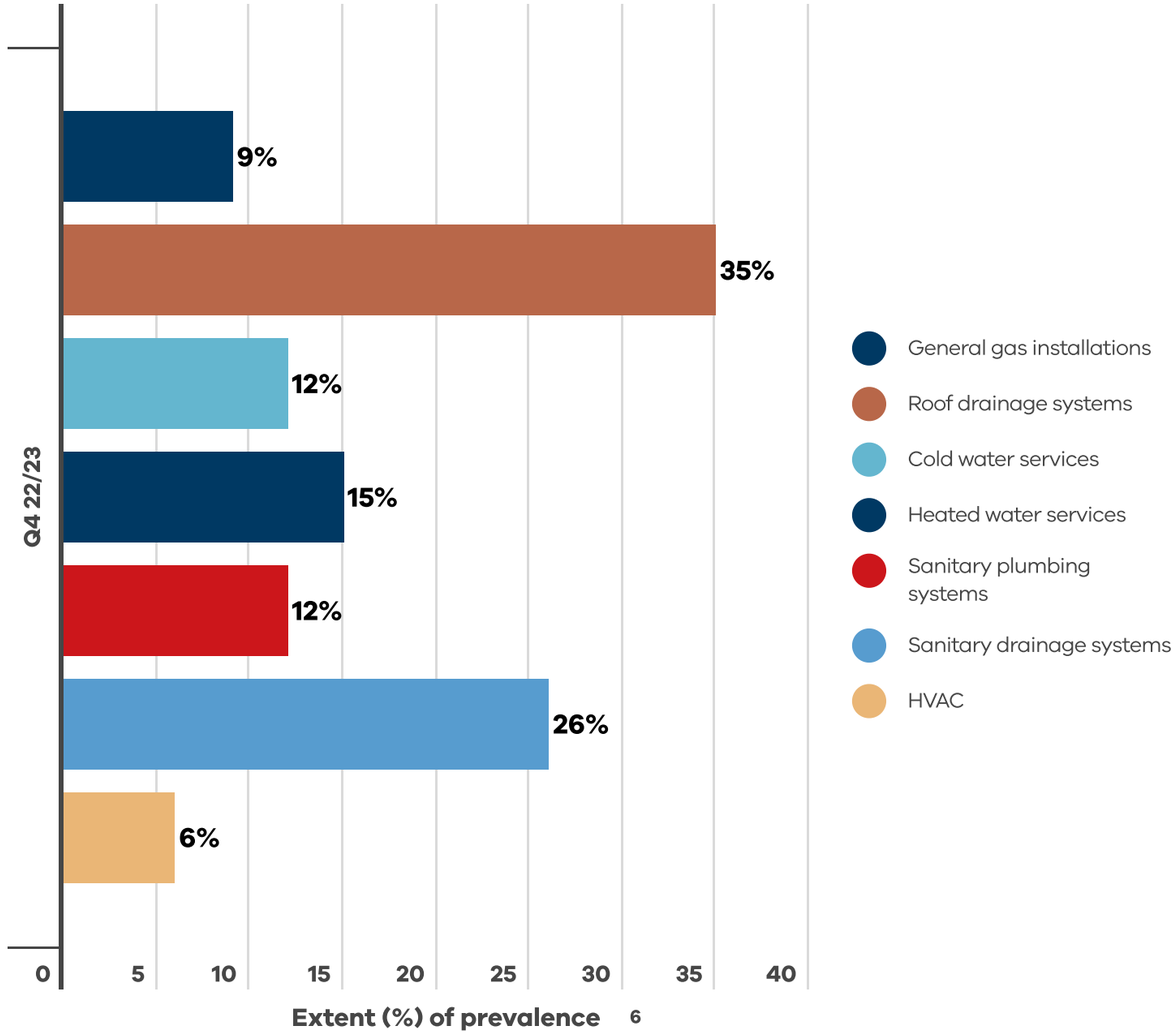


Figure 20: The most prevalent categories where non-compliance risks are observed (medium and high-risk) in proactive inspections of commercial plumbing work in progress.

For more information on the nature of non-compliant issues observed this quarter go to Section 4.3 ('Overview of Plumbing Compliance Risks).

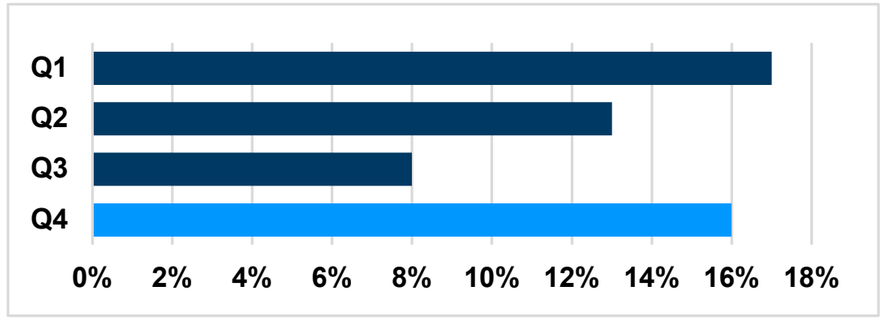
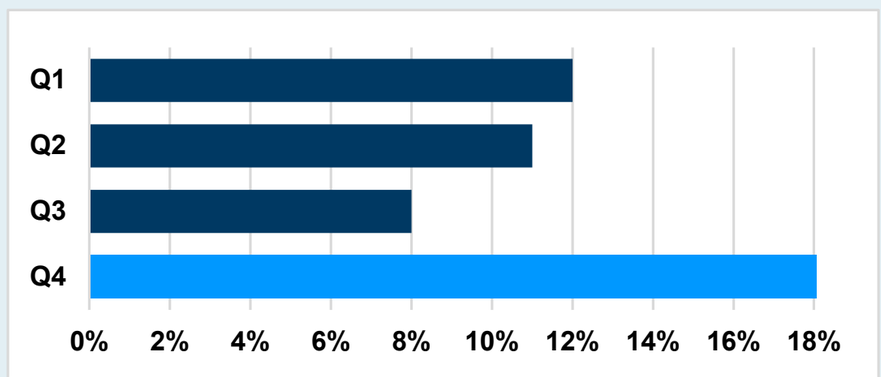
[6] **Extent (%) of prevalence** is calculated by 'number of times an item was observed as non-compliant over the number of times an item was inspected'.

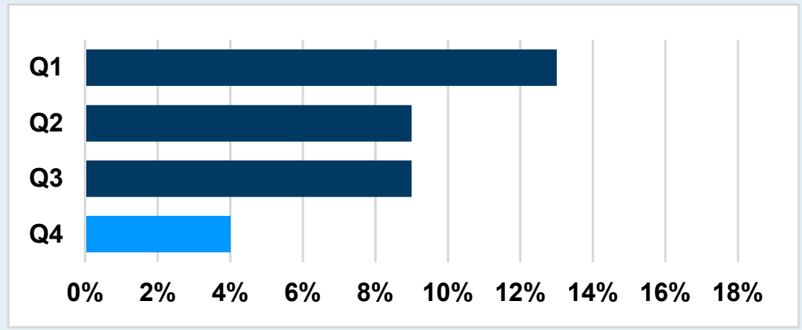
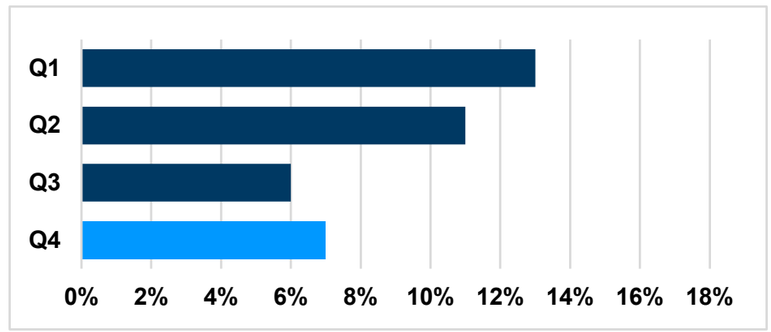
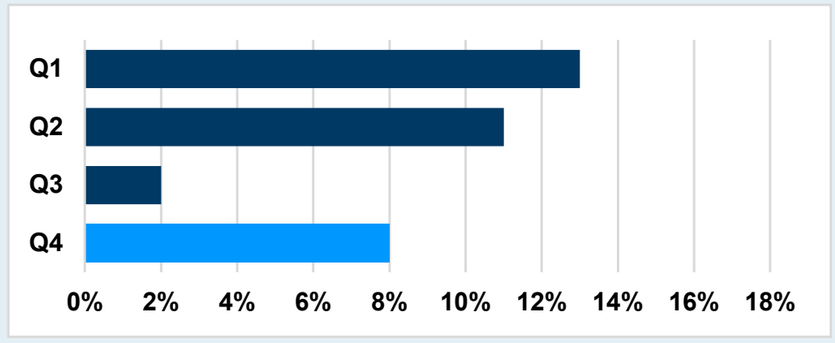
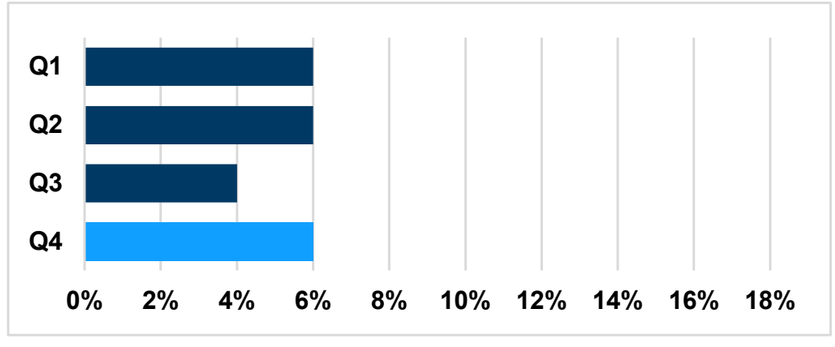
4.3. OVERVIEW OF PLUMBING COMPLIANCE RISK DOMESTIC (CLASS 1)

DOMESTIC

Approximately **10,000 elements** were inspected across **891 inspections** (an average of **11 elements** per inspection) and **620 elements** (across **302 sites**) were identified as a compliance risk requiring rectification or justification. A total of four critical issues (across four sites) were observed, which comprised of OHS issues and swimming pool access issues.

The most common non-compliances observed within the TOP SIX CATEGORIES

Plumbing category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
General gas Installation	190	• Gas flue clearance at a minimum of 500mm above roof is not achieved. • Insufficient separation of gas piping with other services (electrical and water). • Gradient to the ducted heater flue grading away from the appliance towards the flue elbow. • Reversion fittings not installed on the accessible multilayer gas piping. • Exposed multi-layer gas pipe to UV and Proprietary gas piping not labelled at gas meter.	
Roof drainage systems	168	• Pressure flashing not constructed appropriately and not fixed at the required intervals, valley gutters not fixed at required intervals. • Sumps undersize and/or discharge through non-compliant side chutes. • Soaker flashing undersized and/or soaker flashing installed against the direction of flow and stand appears to be undersized. • Inadequate support of suspended stormwater drains and downpipes. • Several 'box gutter' issues (change of direction, incorrectly terminated, reduced in size and/or insufficient overflow provision). Box gutter fixed to frame. • Multiple flashings/capping issues: Undersized, missing pressure flashings and pressure flashings applied to unsmooth brickwork, spreaders discharging over flashings, incorrect fall away from roof on parapet capping, apron flashings not secured at 500mm intervals, lead flashing not stepped/flushed.	

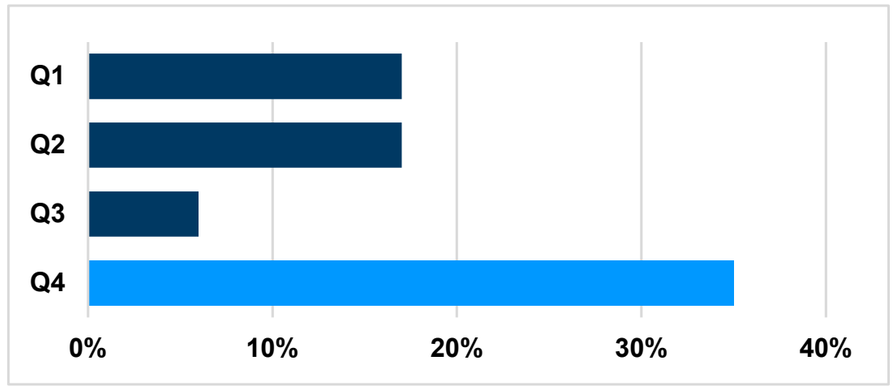
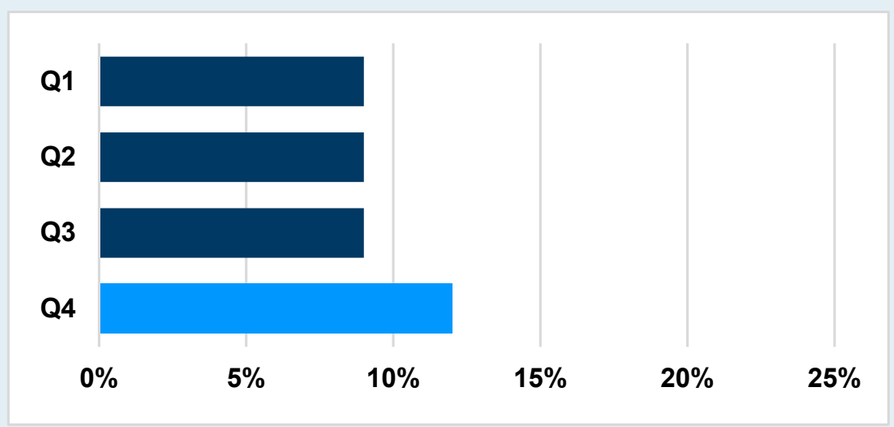
Plumbing category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Sanitary plumbing systems	**30**	• Sanitary and drainage vents not supported appropriately, drainage vents with insufficient gradient. • 88-degree junctions installed on a graded sewer. • Expansion joints not clipped and not installed on above ground sanitary drains. • Junction fittings installed in exclusion zones at several sites.	
Cold water services	**52**	• Water services not protected through concrete slab. • Evaporative cooling unit water connection installed between roof covering, flashing and condensate drains do not discharge over a down pipe. • Issues with separations between water and other services.	
Sanitary drainage systems	**17**	• Minimum required separation between overflow relief gully (ORG) and the lowest fixture not met. • No inspection opening cover and ORG grate not removable. • Inspection shaft covers not installed and not independently supported. • No concrete support under drainage bends and sewer drainage with incorrect fall.	
Heating, ventilation and air-conditioning systems	**47**	• Inadequate fixing and fall of refrigerated pipe work. • Missing or undersized drain for evaporative coolers. • Gas flue pipe does not meet Australian standard (gas flue not secured appropriately). • Electrical conduit used for the HVAC system's condensate drain. • inadequate safe access (with artificial lighting) for the ceiling mounted unit.	

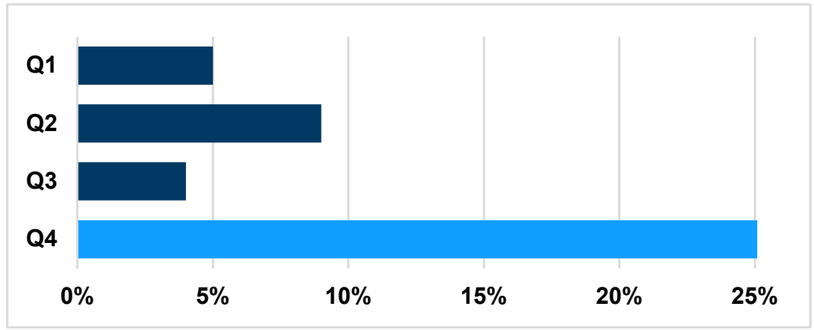
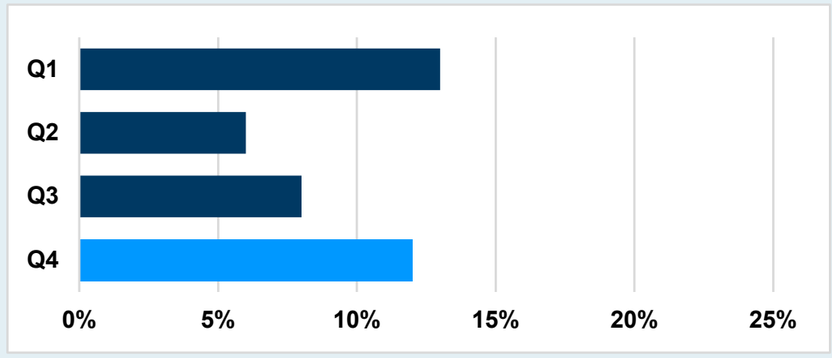
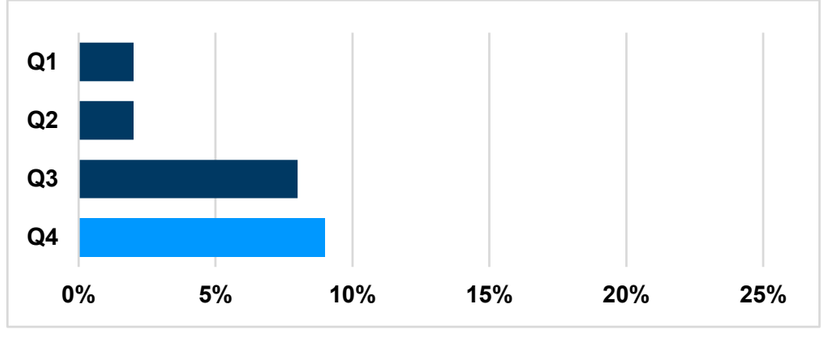
4.3. OVERVIEW OF COMMON NON-COMPLIANT ITEMS OBSERVED

COMMERCIAL (CLASSES 2–9)

Approximately 400 elements were inspected across **36 sites** and **46 elements** (**across 33 sites**) were identified as a compliance risk requiring rectification or justification. No critical issues were found.

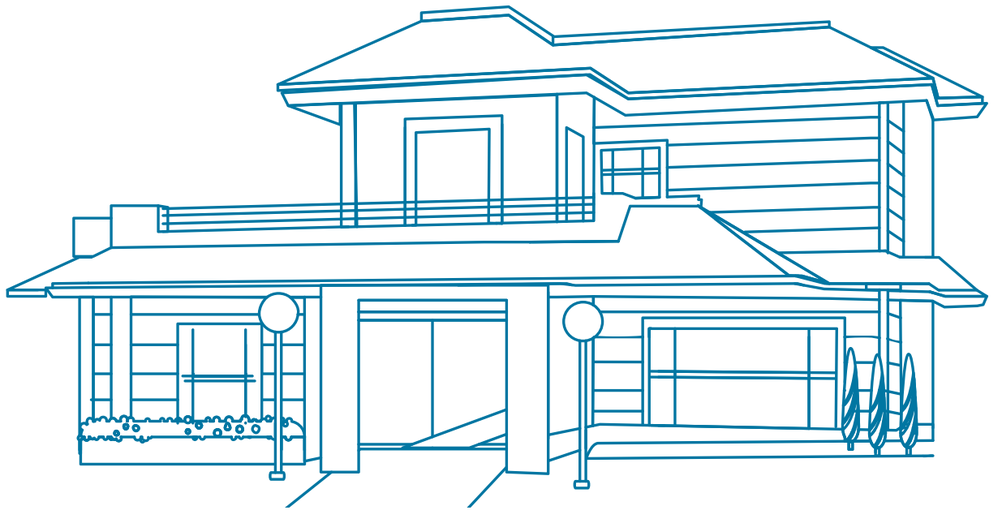
The most common non-compliances observed within the TOP FIVE CATEGORIES

Building category	No. of non-compliant items in category	Common non-compliance in each category	Prevelance per quarter
Roof drainage Systems	12	• Eaves gutters with insufficient expansion joints and fall. • Sumps undersize and/or discharge through non-compliant side chutes, and not supported appropriately. • Box gutter issues: change direction, reduced in size and/or insufficient overflow provision. • Roofing: valley gutter installed on a four-degree pitched roof, upper roof discharging uncontrolled onto the lower roof, valley catchment exceeding 20sqm of roof. • Insufficient fixing of flashings and cappings, parapet cappings with incorrect fall. • Insufficient pitch of roof.	
Sanitary plumbing systems	4	• Junction fittings installed within 600mm of the top of a stack. • No expansion clips on expansion joints and no opening at base of a stack. • Fixture discharge pipe exceeds maximum length.	

Plumbing category	No. of non-compliant items in category	Common non-compliance in each category	Prevalence per quarter
Santiary drainage systems	9	• No concrete support under drainage bends and sewer drainage with incorrect fall. • Sanitary traps not accessible and below spill level. • Sewer drain not lagged through concrete. • Grade not achieved on a below ground sewer. • 40mm sanitary drain installed on grade below ground level.	
Cold water services	4	• No backflow prevention required on flexible shower hoses that reach the floor and toilet. • Inadequate support for cold water services; minimum clipping intervals not achieved, (1600mm unclipped).	
General gas installations	3	• Insufficient separation of gas piping with other services (electrical and water). • Reversion fittings not installed on the accessible multilayer gas piping.	

4.4. PREVALENCE OF PLUMBING COMPLIANCE RISKS - SINGLE OCCUPANCY VS DUAL

SINGLE OCCUPANCY



Common Plumbing Issues

- Roof drainage systems
- General gas installations
- Sanitary plumbing systems
- Cold water services
- Heated water services
- Heating, ventilation, and air-conditioning systems

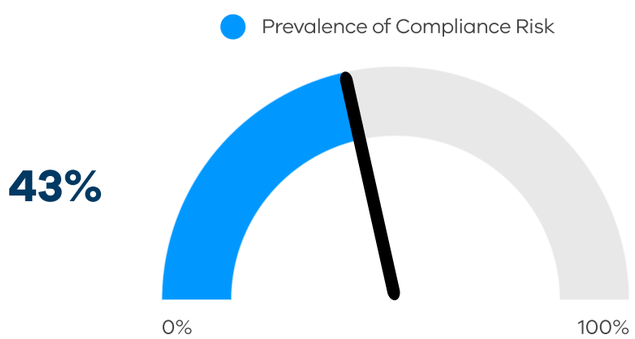
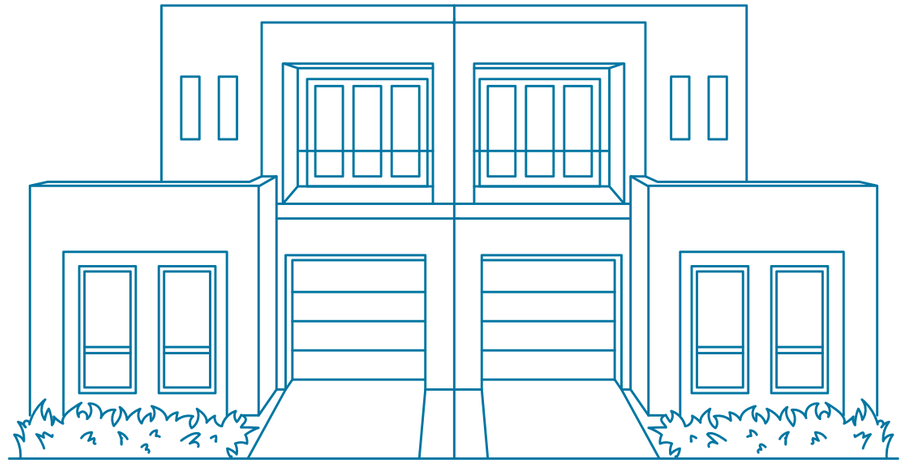


Figure 21: Prevalence of compliance risks observed in proactive plumbing inspections of single occupancy dwellings.

DUAL OCCUPANCY



Common Plumbing Issues

- Roof drainage systems
- Sanitary drainage systems
- General gas installation
- Sanitary plumbing systems
- Cold water services

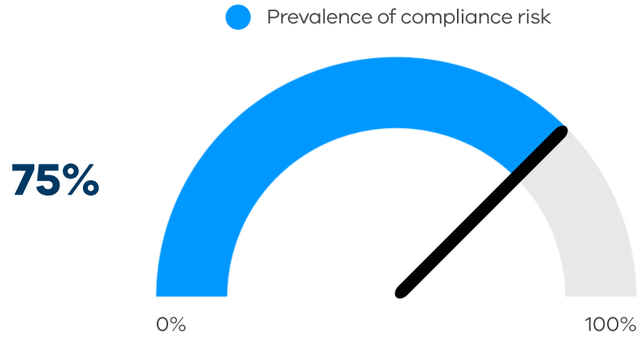


Figure 22: Prevalence of compliance risks observed in proactive plumbing inspections of dual occupancy dwellings.

4.5. PREVALENCE OF PLUMBING COMPLIANCE RISKS BY CLASS

Class	No. of sites inspected	% of compliance risks across class from all inspections	Areas of serious compliance risk for building
Domestic (Class 1 and 10)	**891**	**34%**	• General gas installation • Cold and heated water services • Roof drainage systems • Sanitary plumbing systems • HVAC
Apartments ≥2 sole occupancy (Class 2 + mixed use) and group dwellings and hospitals (Classes 3, 4, 9)	**6**	**100%**	• Roof drainage systems • General gas installation • Sanitary plumbing systems • Cold and heated water services
Assembly building with no dwellings (Class 9b)	**12**	**25%**	• General gas installation • Sanitary drainage systems • Roof drainage systems
Office buildings and cafes, shops and markets with no dwellings (Classes 5, 6 + mixed use)	**8**	**38%**	• General gas installation • Sanitary drainage systems • Above ground stormwater pipework
Warehouse and factories and carparks – no dwellings (Classes 7a, 7b, 8)	**10**	**30%**	• Roof drainage systems • Cold and heated water services • Sanitary plumbing systems

4.6 CASE STUDY – PLUMBING

CONSTRUCTION OF MUTLIPLE CLASS 1 DWELLINGS IN REGIONAL VICTORIA

Overview

A proactive inspection of multiple single and double storey Class 1 dwellings under construction identified more than 30 non-compliances in each dwelling that have the potential to impact the amenity of the dwellings if they were not rectified.

The non-compliances related to a range of poor sanitary drainage work that could have resulted in recurring blockages and water ingress. This work included an incorrectly designed stack (leading to incorrect venting) that did not achieve a minimum grade and PVC joints not constructed appropriately. This could lead to recurring leakages and blockages in the sanitary drainage system and, fixtures (e.g., showers/toilets) not operating efficiently. Stacks are commonly costly to repair as it requires the removal of waterproofing, tiles, and plaster to conduct repairs and the dwelling may become uninhabitable while works are being repaired.

Additionally, 90mm stormwater PVC was installed and used on a below ground sewer drainage system and PVC joints were not constructed correctly. This could have resulted in water leaking into and under the building's structure.

Flexible duct work for the heating and cooling system was not installed correctly, restricting airflow and connections were not applied correctly to starting collars. Condensate drains were also interconnected, compromising the fail-safe leak system.

Above ground gas piping was also found to be non-compliant. The jointing used in gas piping was not constructed in accordance with the manufacturer's instructions and gas piping was not protected from corrosion and sharp objects throughout the dwellings. Further issues were also observed in water pipes that exceeded the maximum clip spacing and were also not protected from sharp objects.

Response

A VBA notification to the RBS and builder prompted the builder to notify the responsible plumber about the non-compliant work. The plumber provided the VBA with photographic evidence to demonstrate rectification of the work, however, not all items were addressed. Due to conflicting advice received from the plumber, the VBA re-inspected the site and found the plumber had provided the VBA with photos that were not relevant to this site and most of the non-compliant matters identified had not been addressed. Further issues were also observed and added to the rectification requirements.

Further Action

Due to the volume and extent of non-compliant items at the site, the VBA plumbing inspector arranged a re-inspection with the construction company's Area Manager and Site Manager to highlight to them the poor plumbing work being produced by their contracted plumbing practitioner.

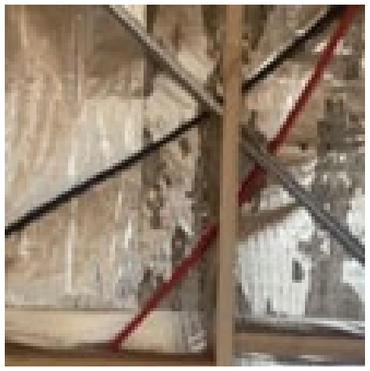
Discharge pipes do not have the appropriate grade contrary to AS/NZS 3500.2:2021 Table 6.6.1

Some risers are not installed parallel, pipe work shall be in the same alignment and grade as the preceding pipes or fittings. AS/NZS 2032:2006 Clause 4.2.3

Incorrect junctions and venting of the sanitary drains contract to AS/NZS 3500.2:2021 clause 9.5.2 & 9.2.2 AS/NZS 3500.2:2021 Clause 6.6.2.3

Gradient of drain going backwards contrary to AS 3500.2: 2021.clause 3.4.1

90mm PVC piping. not suitable for sanitary drainage systems contrary to AS/NZS 3500.2:2018 clause 2.3 and manufactures installation specifications.



Water pipes exceed the maximum clip spacings contrary to AS/NZS 3500.1:2021 Table 5.7.4 AS/NZS 3500.4:2021 Table 4.5.4

Outcome

The builder put work at the site on hold and terminated the contract with the plumbing practitioner. A new plumber was appointment who completed the rectification works and the VBA closed the matter upon reinspecting the site for a fourth time.

The findings by the VBA in this case, and actions taken to bring the plumbing work into compliance addressed real concerns for future amenity of the dwellings and protected the consumer (both current or any future owners) from the burden of non-compliant work.

A VBA inspector subsequently attended four other sites where this builder was operating and observed similar plumbing non-compliances that were also rectified by the newly appointed plumbing practitioner. The plumber in question has been flagged for further attention through the VBA plumbing audit program (PAP) which could lead to further investigation and action.

APPENDICES

APPENDIX 1: PROACTIVE INSPECTIONS PROGRAM - RISK RATING SCALE

The following table shows the PIP risk rating matrix.

The level of risk observed during inspection determines the VBA's response and any actions required of the relevant building practitioners.

LOW-RISK (PASS)	Non-compliance is not identified at inspection, or any non-compliance that is consistent with work in progress and is reasonably expected to be resolved as work progresses.
LOW-RISK (LOW-IMPACT)	It is unlikely that the compliance risk, if left untreated, would cause an adverse effect on the safety and/or amenity of the occupants. Financial loss for future occupants or loss of structural integrity is unlikely.
MEDIUM RISK	It is possible that the compliance risk, if left untreated, would cause an adverse effect on safety and/or amenity of the occupants/public. Financial loss for future occupants or loss of structural integrity is possible.
HIGH-RISK	It is almost certain that the compliance risk, if left untreated, would cause an adverse effect on the safety and/or amenity of the occupants/public. Structural integrity would be significantly compromised and/or total loss of project value would be incurred.

APPENDIX 2: PROACTIVE INSPECTIONS PROGRAM - ELECTRONIC CHECKLIST

SECTION ONE

Guidance on mandatory requirements under the Building Act 1993 and Building Regulations 2018

Building Regulation 2018 Provision and display of permit information (Regulation 41)

Building Act 1993 Part 3 Building Permits (Section 16 - works without a Building Permit or not in accordance with Building Permit, Section 24A- appropriate certificate of insurance issued for cost of building work >$16,000 , Section 24B – Specification of builders in relation to specific building work, Section 25B – Restrictions on owner builders.

Building Act 1993 Part 5 Occupancy Permits

Building Regulation 2018 Part 5 Siting (Regulation 73 to 97 when applicable)

Building Regulation 2018 Part 7 Protection of adjoining property and public

Building Regulations 2018 Part 8 and Part 10 Building work and Designation of special areas of building work (Regulation 132, 150, 152, 153,154)

APPENDIX 2: PROACTIVE INSPECTIONS PROGRAM - ELECTRONIC CHECKLIST CONTINUED

SECTION TWO

Guidance on building work relevant to residential inspections and is broken down into different building stages under the National Construction Code of Australia BCA Vol 2 (class 1 and 10)

Site preparation Earthworks and Site cuts, site surface drainage and termite risk management

Footings and Slabs Preparation Concrete and Reinforcing, site classification, and footings and Slab construction

Masonry Unreinforced and reinforced, accessories, weatherproofing and earth wall construction

Framing Sub-floor ventilation, Timber/Steel Framing, Structural Steel members

Roof and Wall Cladding Roof cladding, Gutters and Down-pipes, Wall Cladding

Glazing

Fire Safety Separation, Smoke Alarms, Heating appliances, bushfire areas, Alpine Area

Health and Amenity Wet Area and External water

Safe movement and Access Stair Construction, Balustrading and Handrails, Swimming pool Safety Barriers, Swimming pool Water recirculation

Additional Construction High Wind, Earthquake and Flood Hazard

Structural Design

Energy Efficiency Building fabric, external glazing, Building Sealing, Air Movement

SECTION THREE

Guidance on building work relevant to commercial inspections and is broken down into different building stages under the National Construction Code of Australia BCA Vol 1 (class 2 to 9)

Section B: Structure

Section C: Fire Resistance Fire Resistance and Stability, Compartment and Separation, Protection of Openings

Section D: Access and Egress Provision of Escape, Construction of Exits, Access for People with Disability

Section E: Services and Equipment Fire Fighting Equipment, Smoke Hazard Management, Lift Installations, Emergency Lighting, Exit Signs and Warning Systems.

Section F: Services and Equipment Damp and Weatherproofing, Sanitary and Other Facilities, Room Heights, Light and Ventilation, Sound Transmission and Insulation.

Section G: Ancillary Provisions Minor Structure and Components, Heating Appliances, Fireplaces, Chimneys and Flues, Atrium Construction, Construction in Alpine Areas and Bush-Fire Prone Areas

Section H: Special Use Buildings Theatres, Stages and Public Halls, Public Transport Buildings

Section J: Energy Efficient Energy Efficient, Building Fabric, Glazing, Building Sealing, Air-Condition and Ventilation Systems, Artificial Lighting and Power, Heated Water Supply and Swimming Pool and Spa Plant, Access for Maintenance and Facilities Monitoring.

APPENDIX 2: PROACTIVE INSPECTIONS PROGRAM - ELECTRONIC CHECKLIST CONTINUED

SECTION FOUR

Guidance on requirements under the Plumbing Regulations 2018, NCC: Plumbing Code of Australia Volume 3 2019 Victorian section and relevant standards that apply to residential and commercial properties in the following categories.

Water Services (Section B of the NCC PCA Vol 3 2019 Vic and AS/NZS 3500:1:2018 and 3500:4:2018) - Cold Water Services, Heated Water Services, Non-Drinking Water Services, Firefighting Water Service

Sanitary plumbing and drainage systems (Section C of the NCC PCA Vol 3 2019 Vic and AS/NZS 3500:2:2018) - Sanitary Plumbing Systems and Sanitary Drainage Systems

Stormwater Drainage Systems (Section F of the NCC PCA Vol 3 2019 Vic and AS/NZS 3500:3:2018) - Roof Drainage Systems, Surface and Subsurface Drainage Systems

Heating, Ventilation and Air-conditioning (Section G of the NCC PCA Vol 3 2019 Vic)

On-Site Wastewater Systems (Section G of the NCC PCA Vol 3 2019 Vic and AS/NZS 3500:2:2018) - On-Site Wastewater Management Systems; On-Site Liquid Trade Waste Systems

Gas Installations as per AS/NZS 5601:1:201 General Gas Installation, Type A Servicing Work, Type A Conversion Work

Unlicensed plumber in the relevant field Unlicensed in: Drainage, Fire Protection, Gas fitting, Irrigation, mechanical, Roofing -Sanitary Water Supply

SECTION FIVE

Guidance on elements concerning immediate life-safety issues to ensure these items are inspected first.

OHS Practices at the site and hazards etc.

Scaffolding Makeshift working platforms, Guard Rails & Kick boards

Electrical Risk Exposed Live Electrical, Power leads & Power boards

Excavation Working in trenches over 1.5m Deep, site cut over 1.5m

Asbestos Debris or removal

Temporary Fencing Site entry is restricted or affecting public

Amenity and housekeeping at the site Rubbish control, materials storage and site toilets

Fall risks Working over 2m in height (Opening in platforms/stair voids, Secured access ladders

Structure Stability Adequate temporary propping & bracing

COVIDSafe Requirements A separate checklist is used during COVID restrictions and covers adherence to mandatory COVIDsafe requirements; physical-distancing, mask wearing, worker limits, QR codes and evidence of a COVIDSafe plans.

IF THESE ITEMS PRESENT AN UNACCEPTABLE RISK, THE RELEVANT CO-REGULATORS ARE CONTACTED IMMEDIATELY BY THE BUILDING INSPECTOR.

APPENDIX 3: COMPOSITION OF HIGH-RISK ELEMENTS OBSERVED IN PROACTIVE INSPECTIONS 2022-23 Q4

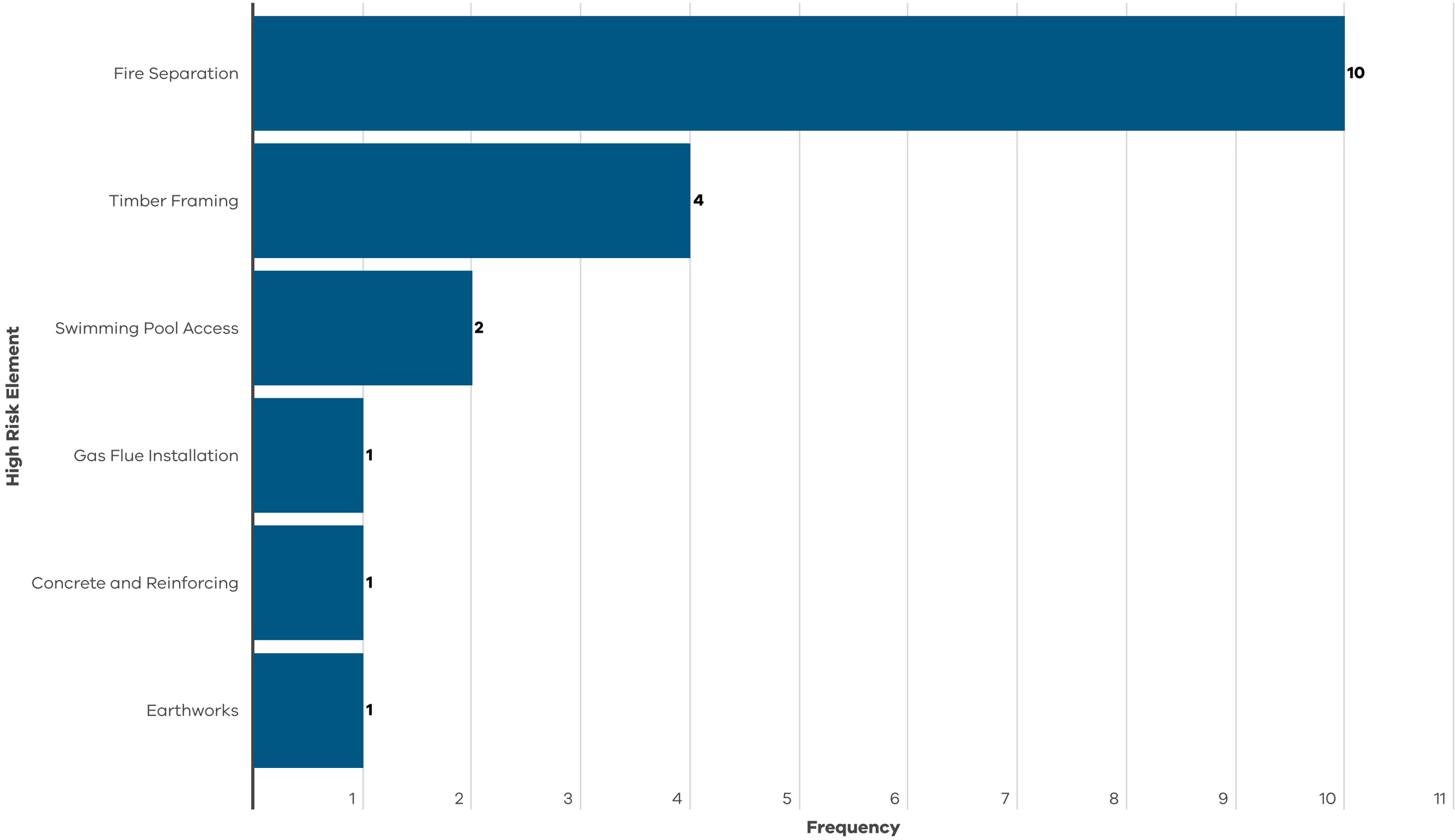


Figure 23: Composition of high-risk elements from proactive inspections this quarter.

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