Proactive Inspections Program Activity Report

APRIL - JUNE 2021

VICTORIAN BUILDING AUTHORITY
BUILDING CONFIDENCE

VICTORIA
State Government

CONTENTS

1. ABOUT

The VBA's Proactive Inspections Program (PIP) is an early-intervention regulatory initiative that identifies non-compliant building and plumbing work and ensures the work is rectified. PIP involves teams of inspectors inspecting building and plumbing works under construction. Our PIP team includes experienced building inspectors, building surveyors and licensed plumbers. Typically, they inspect more than 900 domestic and commercial sites each month. Inspections focus on either building or plumbing work.

In line with the Minister's Statement of Expectations, our goal is to inspect 10 per cent of all building permits issued each year in Victoria. When selecting inspection sites, we analyse building permit data and consider a range of risk factors. We sometimes target certain types of construction to manage risk and ensure intervention at the earliest possible stage.

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

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's removal before an occupancy permit is granted.

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 and people nearby and on the amenity of the building itself.

1.1. BENEFITS

PIP improves safety and compliance outcomes for building and plumbing work in Victoria through early identification and 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 practitioners, not the owner) and avoids impacts on the safety, health and amenity of future occupants if the compliance risk had remained undetected or unresolved.

Information and intelligence gathered through PIP enables the VBA to provide advice on building and plumbing standards and education and training in the industry.

1.2. 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:

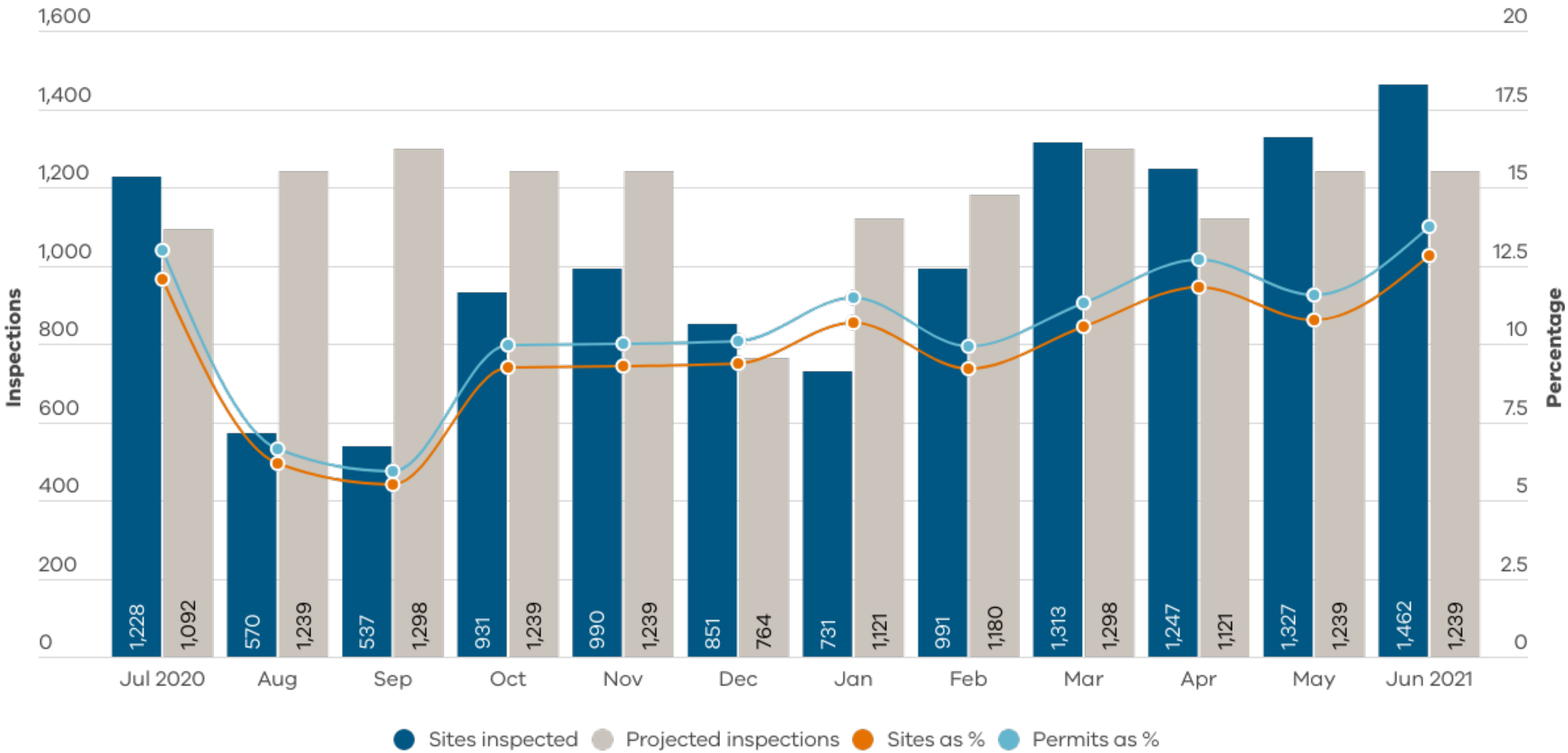
- building and plumbing work broken down into different building stages under the National Construction Code – Volumes 1 and 2 (Building Code of Australia)
- mandatory requirements under the Building Act 1993, Building Regulations 2018 and Plumbing Regulations 2018
- the display of permit information
- 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.

1.3. PERFORMANCE YEAR TO DATE

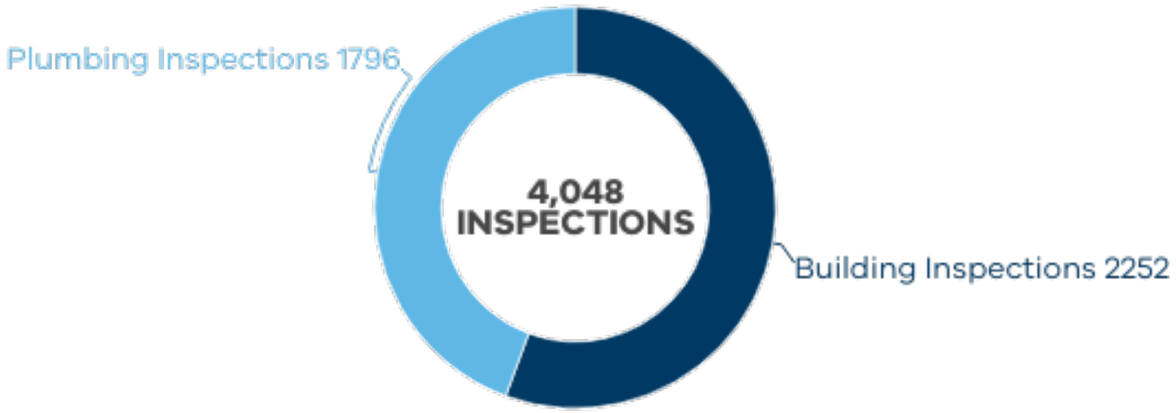
The graph below illustrates the number of sites inspected each month and shows how the VBA is tracking against the Minister's Statement of Expectations to inspect 10 per cent of new building permits every year.

INSPECTIONS YEAR TO DATE - JULY 2020 TO JUNE 2021



Discrepancies between projected and completed inspections may occur depending on unforeseen industry activity and resource allocation (eg COVID-19 restrictions).

2. Q4 IN FOCUS

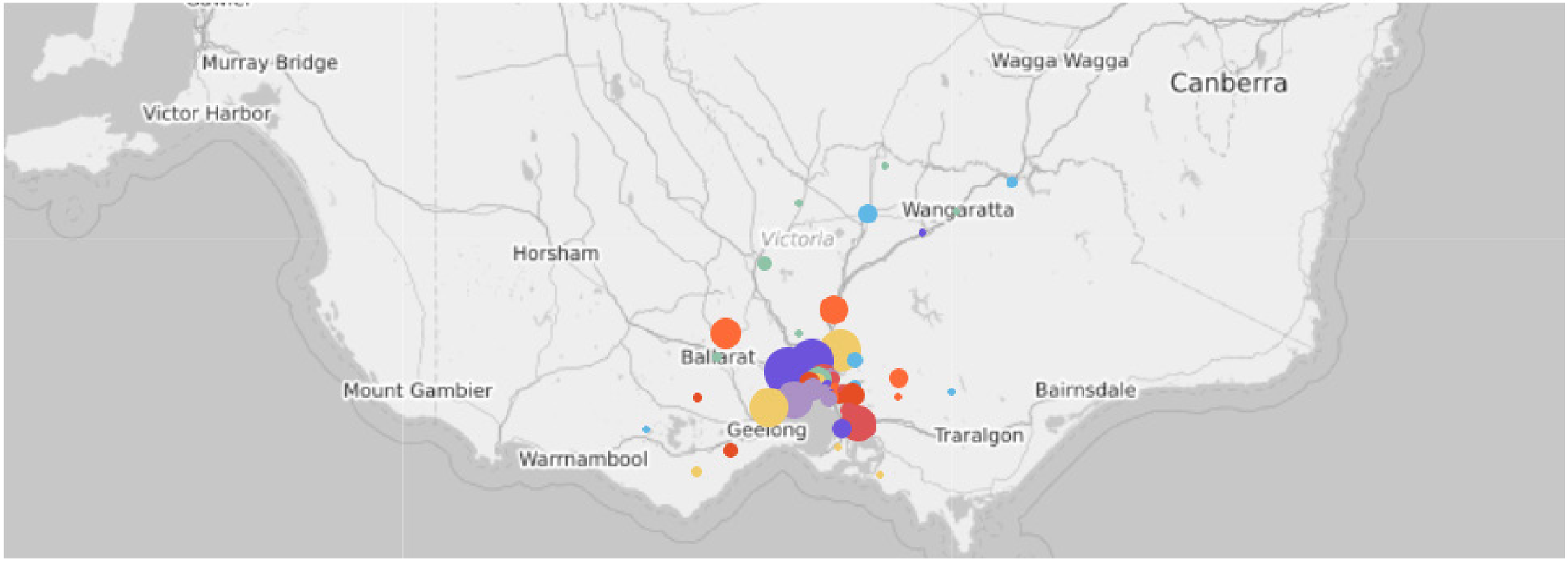


A total of 4,048 inspections (comprising 2,252 building and 1,796 plumbing inspections) were conducted across 50 municipalities in Victoria, covering 722 builders and 174 building surveyors across the state.

In Q4, fieldwork capacity was at pre-pandemic levels which resulted in an overall increase of 1,013 inspection compared to the previous quarter (Jan to March 2021).

Sites are typically inspected based on defined risk factors, which assign a higher risk rating to building permits that relate to buildings intended for human occupation and to practitioners who conduct higher volumes of work.

Q4 INSPECTION MAP - APRIL 2021 TO JUNE 2021



Larger Dots = More Inspections
https://vba.vic.gov.au/building/complaints-compliance-enforcement/proactive-inspections-program/proactive-inspections-program-reports

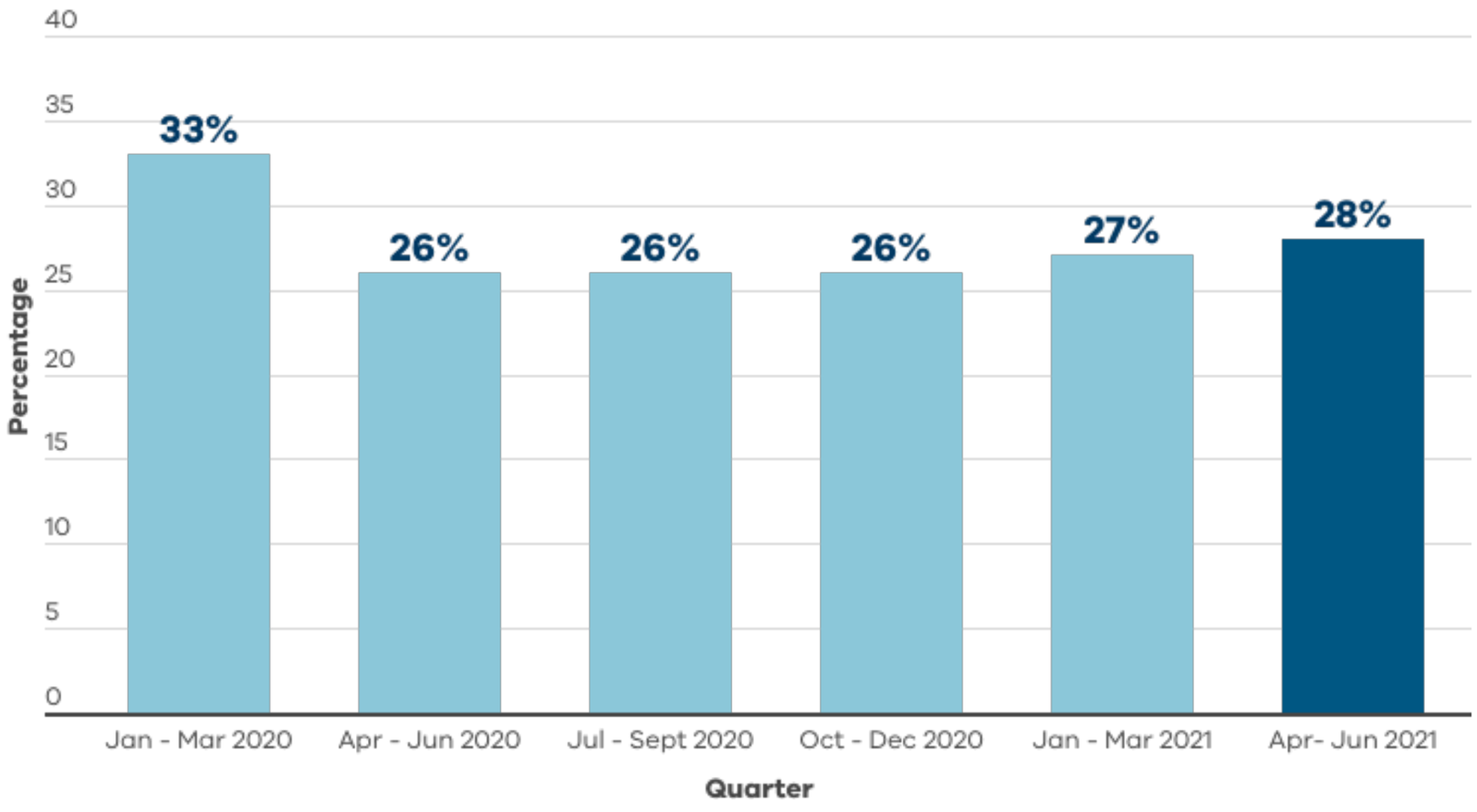
2.1. WHAT WE FOUND

1,139 or 28% of inspections conducted during the quarter identified at least one compliance risk, which, if not appropriately considered or addressed, had the potential to cause:

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

The rate of compliance risk observed in this quarter decreased by 5% compared to the previous quarter (January 2021 to March 2021) but is consistent with the rate reported in all other previous quarters since April 2020.

OBSERVED COMPLIANCE RISK



CRITICAL ISSUE

1% of inspections identified 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.

This rate decreased from 2% compared to the previous quarter (January to March 2021) but is consistent with the rate reported in all other previous quarters since January 2020.

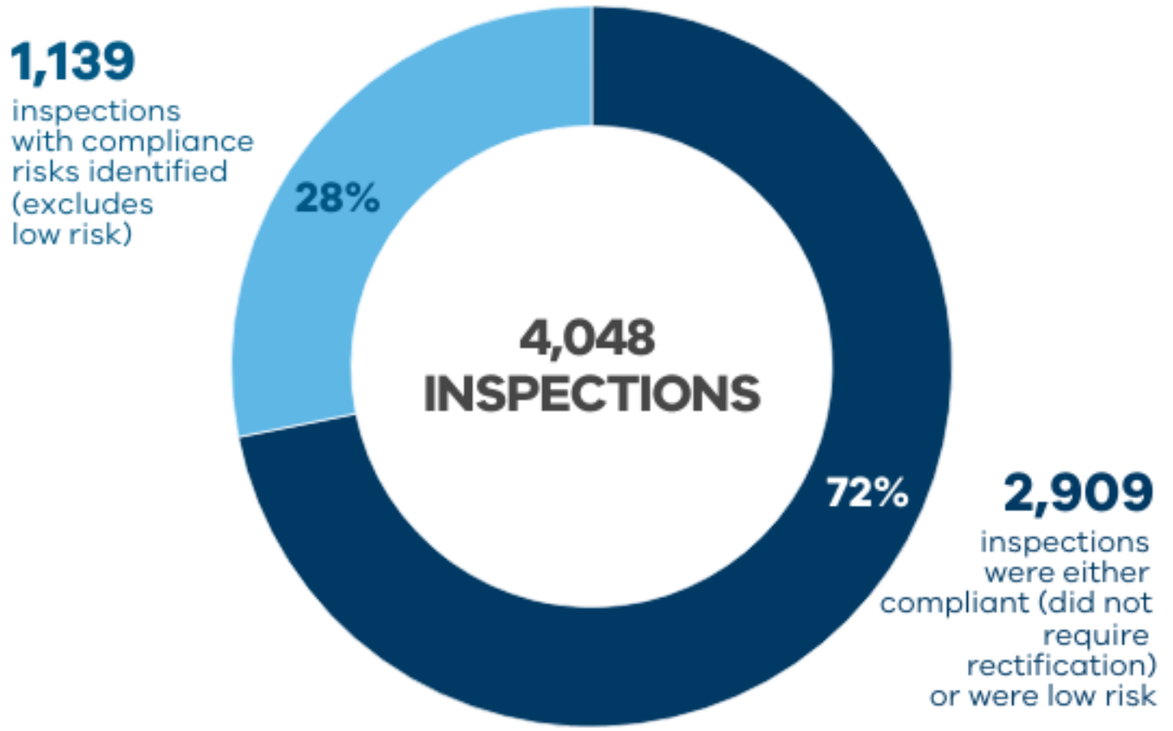
Sites with OHS risks are reported in this category, with breaches referred to the relevant regulator on the same day.

2.2. ACTIONS TAKEN BY THE VBA

The VBA sent 1,139 notifications to practitioners requiring them to respond to the compliance risks identified by the PIP.

Typically:

- 20% of the notification sent to practitioners result in the builder and/or RBS providing all relevant documents (such as an approved performance solution, engineering drawings or certificate of compliance from a registered practitioner) showing 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; and
- 2% of the notifications result in the practitioners demonstrating the work is incomplete rather than non-compliant and will be resolved as the build progresses.
- the remaining notifications of non-compliant work identified requires rectification and the practitioners must provide the RBS or the VBA with proof the work has been brought into compliance (for example, by forwarding photographs of rectified work).



2.3. ENFORCEMENT ACTIVITY

The VBA expects the RBS to manage any required rectification 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 needing 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.

WHO RECEIVES THE NOTIFICATIONS?

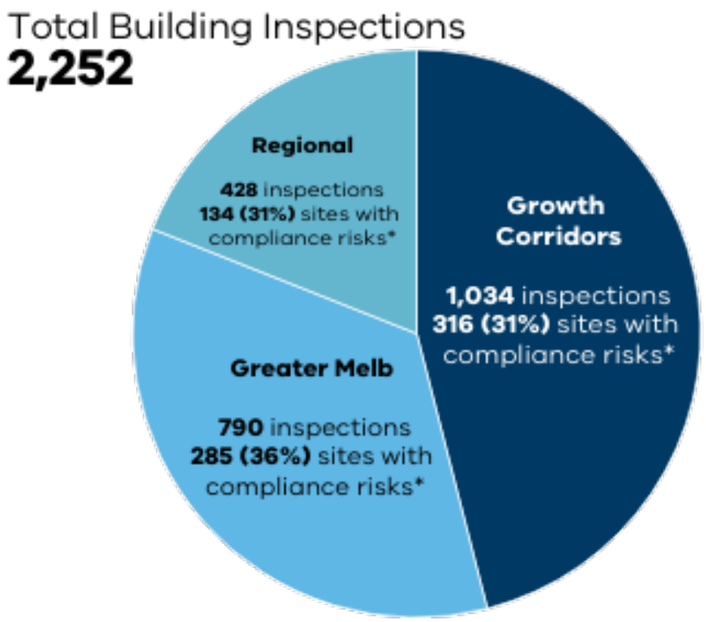
The builder and relevant building surveyor (RBS) are notified when compliance risks are identified. However, the builder is the primary addressee for potentially non-compliant building work if the elements have not been subject to a mandatory inspection stage. Where elements have been subject to mandatory inspection, the RBS is the primary addressee because they are the party who attests that the building work is compliant.

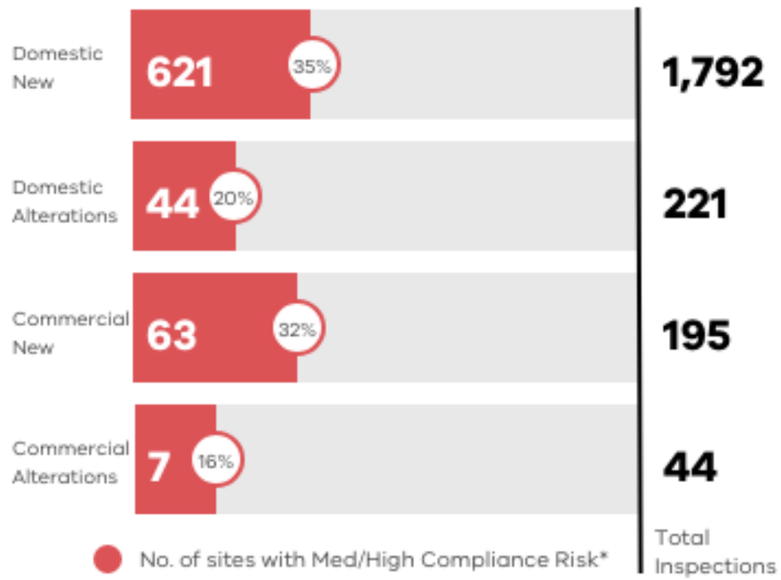
The RBS will also be the primary addressee when permit documentation lacks information (such as a performance solution) or in situations where the RBS has not considered mandatory items (such as fire separation in dual-occupancy buildings).

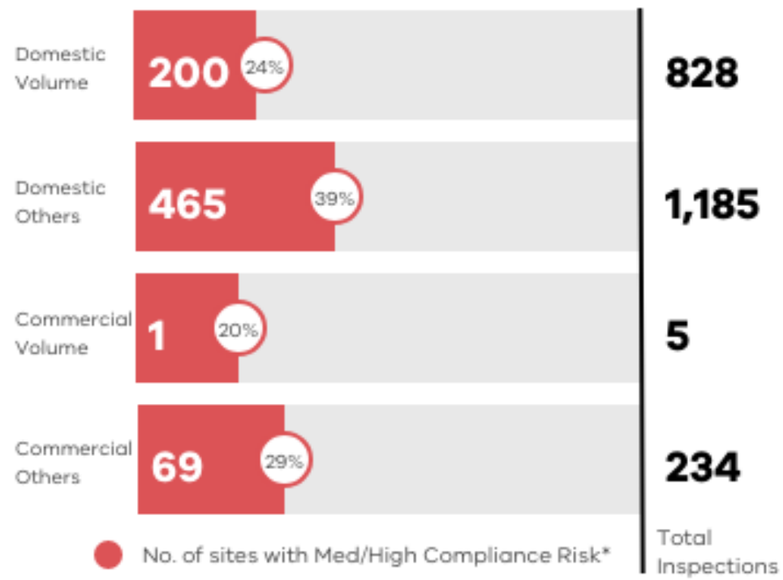
The builder is also the primary addressee for potentially non-compliant plumbing work because the plumber is not named in the building permit documents. The VBA relies on the builder to provide the plumber's details. If provided, the VBA will also notify the plumber of any potential issues.

3. BUILDING INSPECTIONS

3.1. OVERVIEW OF BUILDING INSPECTIONS CONDUCTED IN Q4







GEOGRAPHIC TRENDS

Volume – Greater Melbourne 'Growth Corridors' in Q4 had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes comparisons – The comparisons across different regions of Victoria provide an interesting trend.

- **Domestic Class 1 buildings –** Significantly higher prevalence of non-compliant issues were observed on Domestic Class 1 building sites in 'Greater Melbourne' (38%) compared to other regions of Victoria.
- **Commercial Class 2-9 buildings –** A different trend was found in commercial building sites. 'Regional' areas of Victoria have the highest prevalence (46%) of non-compliant issues observed and 'Greater Melbourne' the lowest (28%). Noting the commercial building sample size in Regional Victoria is small.

NEW BUILDS VS ALTERATIONS

Volume – 'New Builds' in Q4 had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes comparisons – A higher prevalence of non-compliant issues were observed during inspections of 'New' buildings compared to buildings going under 'Alterations' for both domestic and commercial building sites.

LARGE VOLUME BUILDERS VS OTHER BUILDERS

Volume – 'Large Volume Builders', in Q4 had the highest number of inspections undertaken because 'Large Volume Builders' typically build new dwellings in growth corridors areas of Melbourne

Inspection outcomes comparisons – A lower prevalence of non-compliant issues were observed during inspections of sites managed by 'Large Volume Builders', compared to all other buildings for both domestic and commercial building sites.

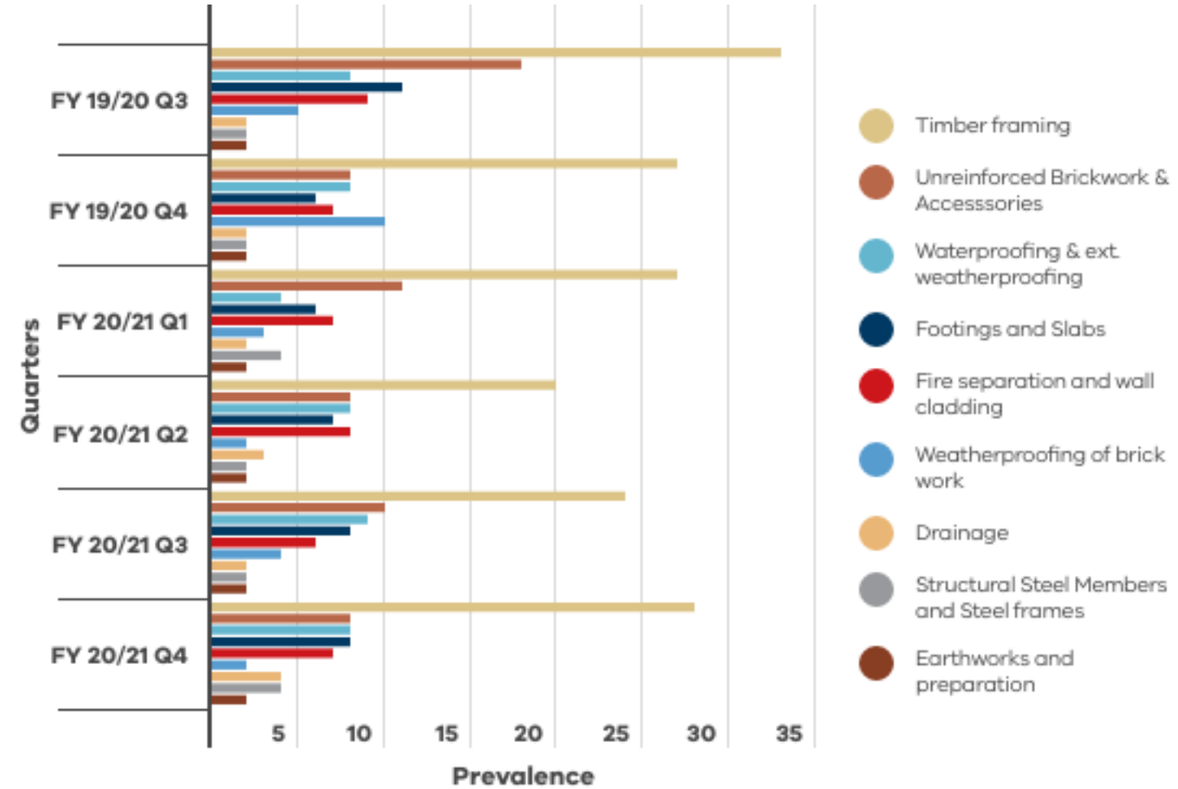
The VBA reviews trends like this to update its risk-based site selection to ensure it selects sites based on the highest risk to the adverse effect on the safety or amenity of future building occupants, and the public.

*Number of sites inspected with at least one medium/high compliance risk observed.

3.2. OVERVIEW OF WHERE THE COMPLIANCE RISKS ARE FOUND

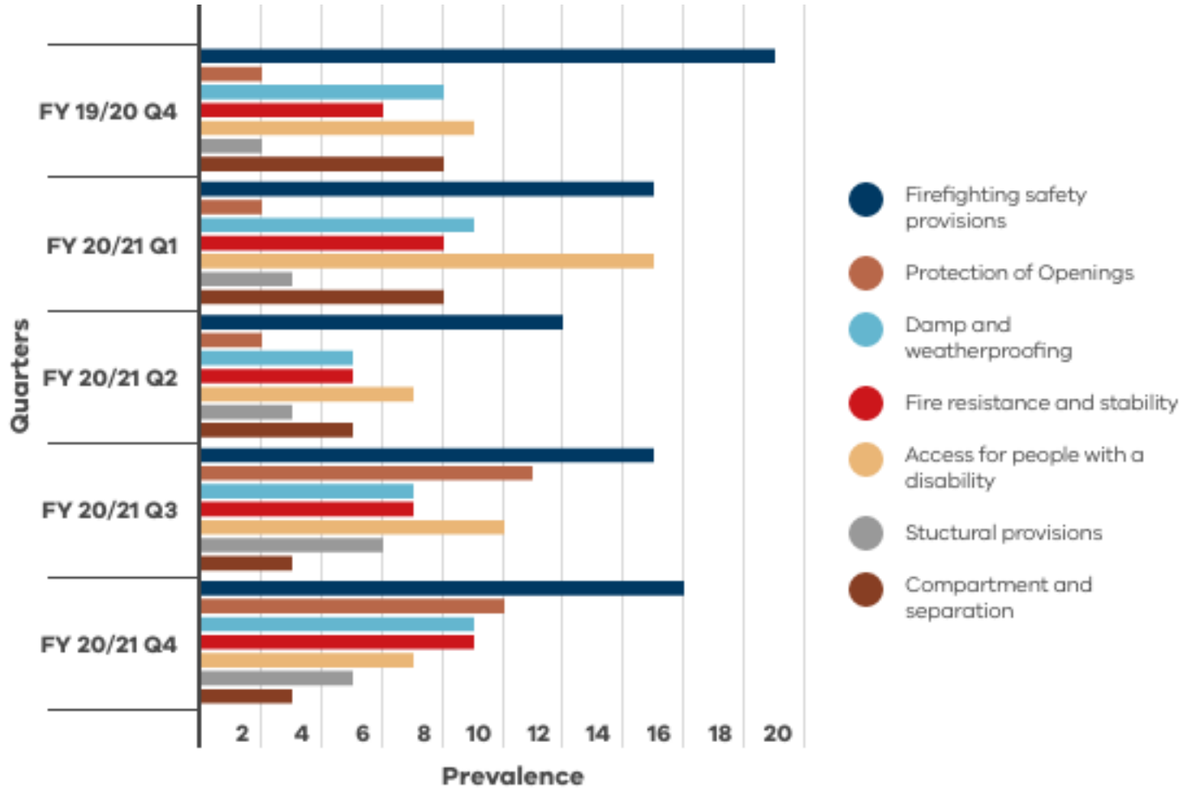
DOMESTIC (CLASS 1)

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



COMMERCIAL (CLASS 2)

Non-compliant issues in commercial building work have also remained consistent each quarter, with the six most common categories of non-compliance identified this quarter largely the same as previous quarters.



It is important to note that the prevalence of non-compliance risks observed in timber frames is higher than other categories, as it reflects the large number of items assessed in a timber frame compared to the other categories. Percentages, therefore should not be compared between categories due this variable.

Appendix 3 and 4 provides more detailed reporting of the proactive inspections undertaken during the quarter, including information on prevalent compliance risk elements and details of how critical items were rectified.

3.3. OVERVIEW OF BUILDING COMPLIANCE RISK

DOMESTIC (CLASS 1)

Approximately 56,000 elements were assessed across 2,013 domestic building sites in Q4 (an average of 28 elements per inspection), of which 1,191 elements (across 665 sites) were identified as a compliance risk and required rectification or justification. Of these elements, 53 were critical (across 43 sites) and required immediate attention.

Examples of these issues included:

FOOTINGS AND SLAB CONSTRUCTION

Construction of a new single storey dwelling, in the City of Hume had:

- an edge beam that was not deepened to match the garage beam level in accordance with the engineer's design, and
- service pipes were also exposed in two locations.

Construction of dual occupancy dwellings, in the City of Maribyrnong had multiple issues:

- footings were undersized and poorly excavated,
- insufficient use of bar chairs to support the trench mesh and the slab mesh (around pipe penetrations) had excessive cuts with no additional steel reinforcement applied,
- penetrations to the vapour barrier by plumbing pipes/ fittings were not taped or sealed with a tight fitting sleeve, and
- there were no construction joints between units and all edge and internal beams were deepened between 900mm-1.3m in lieu of the required 600mm as per approved engineering drawings.

FIRE SEPARATION AND WALL CLADDING

At four sites, fire separating walls were not constructed as per manufacturers guidelines:

- lack of mineral wool at external wall intersections,
- penetrations in shaftliners, and
- no silicone along bottom tracks, and absence of 20mm gap between frame and shaft liner.

Installation of a fire-rated separating wall between dwellings in multi-unit development, in the City of Brimbank:

- was not constructed as per manufacturers guidelines: there were screw penetrations through panels, and
- L Clips were placed midway of stud wall (reducing the acoustic performance) and the sheeting was damaged.

Construction of four, double storey dual occupancy dwellings, in the City of Kingston, had multiple issues with the construction of the fire separation walls:

- there were breaks in the fire separating walls between units due to a bulkhead, and
- throughout the constructions, there were openings and gaps between the panels that form part of the separating wall.

Construction of a second dwelling and a carport to the existing dwelling, in the City of Casey had EPS installed to the external wall on the front façade, required to have an FRL.

DOMESTIC (CLASS 1) CONTINUED

Further examples of issues found in Domestic (Class 1) builds

EARTHWORKS, AND PROTECTION OF ADJOINING PROPERTIES

Construction of a double storey dwelling in the City of Manningham had a site cut of 1.6m within 300m of the boundary without any protection work in place.

SWIMMING POOL ACCESS

At three sites, barriers were missing or inadequate around the construction of swimming pools.

These serious matters are referred to WorkSafe on the same day and/or rectified with 48 hours.

OHS AND PUBLIC SAFETY

Inadequate OHS and public safety provisions were identified at six sites during the quarter. The sites had:

- no fall protection openings in platforms/stair voids,
- no protective measures in place of a disturbed asbestos wall, and
- inadequate temporary propping; an unsupported masonry opening was found in an external wall of the building which was in danger of collapse due to a missing lintel and the slenderness of the pier supporting the upper-level loads.

These serious matters are referred to WorkSafe on the same day and/or rectified with 48 hours.

SIDE AND REAR SETBACKS

Additions and alterations to an existing dwelling in the City of Glen Eira had a setback, not in accordance with Regulation 79 (side and rear setbacks), causing a concern for compliance with BCA NCC Vol 2, Part 3.7.2 (fire separation of external walls).

The RBS issued the Owner-Builder with a Direction to Fix Building Work. Fortunately, the Owner-Builder was successful in receiving a retrospective Report and Consent from the council for a reduced side boundary setback.

COMMERCIAL (CLASSES 2–9)

Approximately 3,800 elements were assessed across 239 sites (an average of 16 elements per inspection), of which 197 elements (across 70 sites) were identified as a compliance risk requiring rectification or justification. Of these elements, 3 were critical (across 2 sites) and required immediate attention.

Examples of these issues included:

ACCESS FOR PEOPLE WITH A DISABILITY

At several sites: luminance contrast of doorways and visual indicatiors on glazed doorways not provided for.

Ground floor hallway of a four-storey apartment development, in the City of Banyule, did not provide the minimum space for a wheelchair to make a 90° turn.

Construction of a four-storey apartment building, in the City of Boroondara, installed a non-continuous handrail throughout the flight of stairs.

FIRE FIGHTING EQUIPMENT, CONSTRUCTION OF EXITS & PROVISION OF ESCAPE

At several sites – No fire extinguisher provided on each storey adjacent to exists.

Alterations and additions to a medical centre, in the City of Greater Geelong, had stairs constructed with a greater than 5mm variation in adjacent rises/ goings and mid-flight going was less than 250 mm wide.

DAMP AND WEATHER PROOFING/ WET AREAS & EXTERNAL WATERPROOFING

At several sites bathroom floors were not graded to permit drainage to a floor waste.

The wet areas in a construction of single occupancy units, in the City of Port Philip had no water stops installed at floor level openings as per AS3740.

Construction of a two-storey apartment building with a basement carpark, in the City of Moreland, had no provision for floor waste in laundries located above the single occupancy units.

FIRE RESISTANCE STABILITY & PROTECTION OF OPENINGS

At several sites there were:

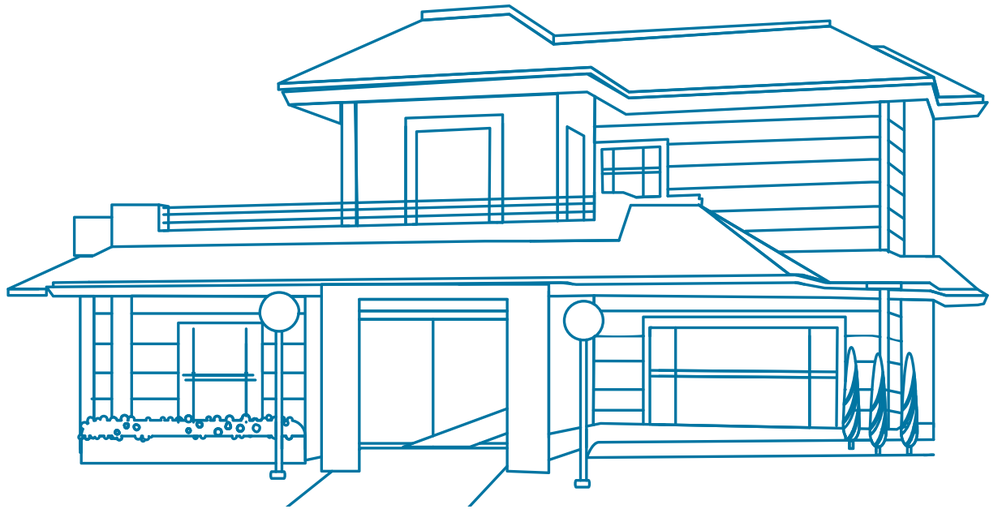
- unprotected service pipe penetrations through fire walls and floor slabs between fire compartments, and
- unprotected openings within 3m of side allotment boundary.

Construction of four-storey apartments over basement carpark, in the City of Stonnington, had:

- used timber noggings in a wall required to be non-combustible, and
- plumbing services were also penetrating the fire rate wall that were not sealed with a tested system, in accordance with C3.15.

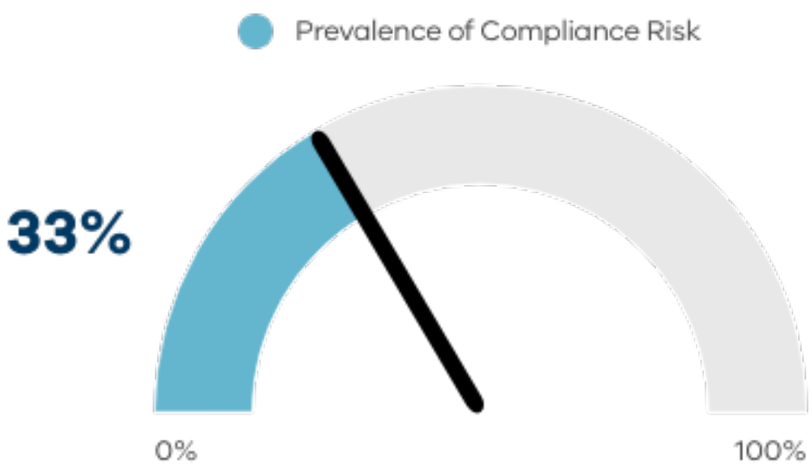
3.4. PREVALENCE OF COMPLIANCE RISKS IN DWELLINGS

SINGLE OCCUPANCY

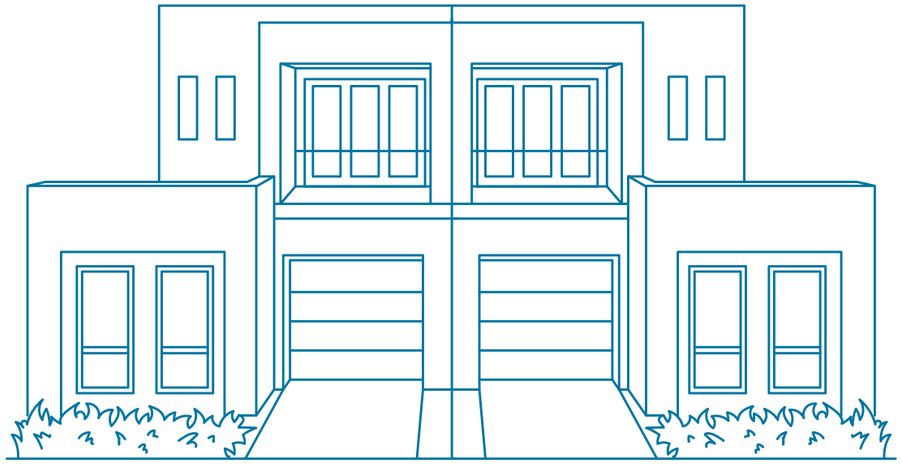


Common Building Issues

Timber framing
Unreinforced masonry
Footing and slab construction
Fire separation
Wet areas and external weatherproofing of masonry

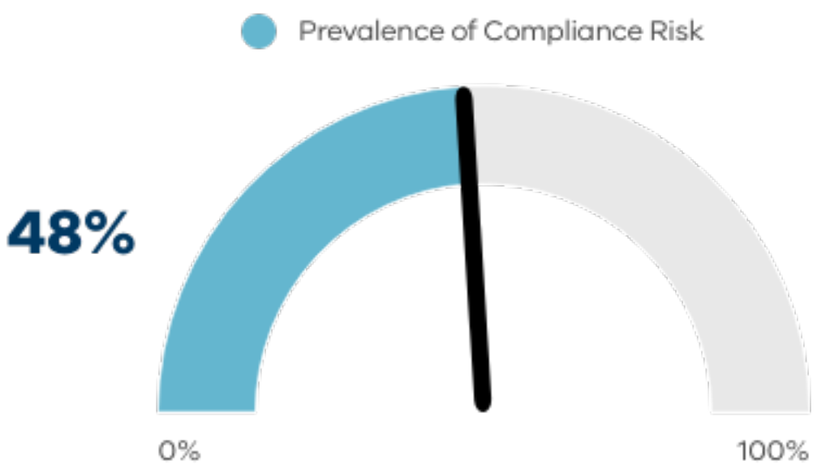


DUAL OCCUPANCY



Common Building Issues

Fire separation
Timber framing
Unreinforced masonry and accessories
Wet areas & external waterproofing
Footing and slab construction



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)	**2013**	**33%**	• Timber framing • Unreinforced brickwork and accessories • Wet areas and external waterproofing • Footing and slab construction • Fire separation
Apartments ≥2 sole occupancy (Class 2 + mixed use) and group dwellings and hospitals (Classes 3, 4, 9)	**143**	**34%**	• Damp and Weatherproofing • Fire resistance and stability • Protection of openings • Fire Fighting Equipment, provision of escape, Construction of exits • Compartment and Separation • Fire separation
Assembly building with no dwellings (Class 9b)	**21**	**23%**	• Structural Provisions • Sanitary and Other Facilities • Access for People with a Disability • Fire Resistance and Stability
Office buildings and cafes, shops and markets with no dwellings (Classes 5, 6 + mixed use)	**57**	**23%**	• Protection of Openings • Fire Fighting Equipment, provision of escape, Construction of exits • Access for People with a Disability • Structural Provisions • Fire Resistance and Stability
Warehouse and factories and carparks – no dwellings (Classes 7a, 7b, 8)	**18**	**17%**	• Fire Fighting Equipment • Protection of Openings

3.6. CASE STUDIES

CONSTRUCTION OF A NEW CLASS 1 DUAL OCCUPANCY DWELLING

Serious foundations issues – concrete pier not installed as per engineering design

Overview

The proactive inspection of four double-storey townhouses under construction

- observed a corner of the concrete slab edge beam (at the rear townhouse) was unsupported, and
- the foundation material had been washed away.

A medium risk letter was sent to the builder and RBS requesting comment from the design engineer.

Response

After the builder provided an underpinning detail from the design engineer it became clear that a 450mm diameter 2m deep concrete pier was supposed to be located at the corner of the concrete slab.

Furthermore, the builder provided photographs of the underpinning work that had been carried out without a building permit and not in accordance with the engineer's design as the underpins had been constructed to 1/6th of the area required.

Outcome

As a result, the building inspector was referred to investigations for approving the bored pier, pre-slab and slab steel inspection without ensuring that a bore pier was located at the corner of the concrete slab

Additionally, the builder was referred to investigations for not carrying out work in accordance with the approved plans and carrying out building work without having a building permit.

At present the VBA is still awaiting a satisfactory approved design for the concrete pier.

Also observed on site was exposed concrete slab steel reinforcement in multiple locations and therefore not covered by the minimum 40mm of concrete as required by clause 5.3.2 of AS 2870 – 2011.

The builder provided an approved rectification detail from the design engineer and photographic evidence of rectification work undertaken.

CONSTRUCTION OF A NEW CLASS 2 DWELLING

Concession under C1.5 of Volume 1 incorrectly applied

Overview

The proactive inspection of a four, three-storey townhouses over a basement car park and a subsequent review of the Building Permit revealed the RBS had applied the concession under C1.5 of Volume 1 of the BCA. The concession allowed a Type C construction for a Class 2 building with a rise in storeys of 2 and a Class 7a basement when the Concession was not applicable and Type B construction was required.

Response

The builder and RBS did not agree with the view that the concession could not be applied in this scenario, and clarification from the VBA's Technical and Regulation department as well as the Australian Building Code Board (ABCB) was requested.

Both the VBA and ABCB agreed, that C1.5 could not be used where the Class 2 building was constructed above a Class 7a basement.

Outcome

As a result, a fire engineer was engaged to prepare a performance solution and additional measures were required to allow the Type C construction.

The RBS and builder were referred to investigations.

Nature of Building Work

Description:	**Construction of three (3) dwellings over a basement car park & front fence**
Storeys contains:	**3**
Rise in storeys:	**2**
Effective height:	**3.63m2**
Type of construction:	**C**
Version of BCA applicable to permit:	**2019**
Stage of Building Work Permitted:	**Stage 2: Completion of Building Works**

Cost of Building Work:	**$2,130,000.00**
Total floor area of new building work in m^2:	**572**
Total Cost of Building Work (All Stages):	**$2,530,000.00**

Building classification

Part of Building:	BCA Classification:
New Building	2
Carpark	7a

CONSTRUCTION OF NEW CLASS 1 DWELLING

Site cut over easement without approval

Overview

The proactive inspection of a single storey dwelling revealed, a site cut and retaining wall had been carried out over a sewer and stormwater easement without a building permit or the report and consent of the relevant reporting Authorities.

It was apparent that the retaining wall was constructed too close to the sewer and stormwater pipes were therefore located within the easement. The footings for the retaining walls were also not below the angle of repose of the pipes.

A medium risk letter was sent and a copy of building permit documents from Council reviewed.

Response

An amended engineering design for the retaining walls was submitted and approved by the RBS, however the Report and Consent of the Stormwater Authority (Hume City Council) was not obtained prior to the issue of the building permit.

Outcome

As a result, the builder was referred to investigations for carrying out building work without having a building permit. The RBS was also referred for issuing a building permit without ensuring the Report and Consent of the relevant building authority was obtained.

CONSTRUCTION OF NEW CLASS 2 DWELLING WITH A BASEMENT CARPARK

Inadequate protection of openings and non-compliant fire safety provisions

Overview

The proactive inspection of a Class 2 building with a Class 7a basement carpark revealed multiple issues in relation to protection of openings, fire-fighting equipment and room heights:

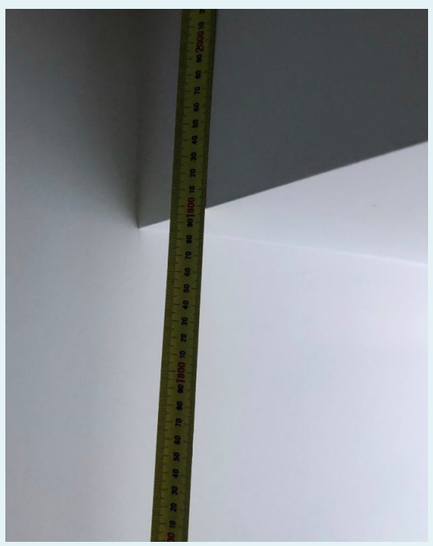
- plumbing penetration from the basement carpark were not protected with fire collars in accordance with C3.15 of Volume 1 of the BCA and openings in the floor and ceilings for services were not protected in accordance with C3.12.
- the ceiling height above the stairway was less than the minimum 2m required by Clause F3.1 of Volume 1 of the BCA, and
- the minimum workspace clearances of the 'fire indicator panel' did not comply with the requirements of clause 2.1.2(b) of AS 1670.4.

Response

A VBA notification of medium-risk building activity, sent to the builder and RBS, prompted the RBS to issues a Directions to Fix Building Work to the builder.

Outcome

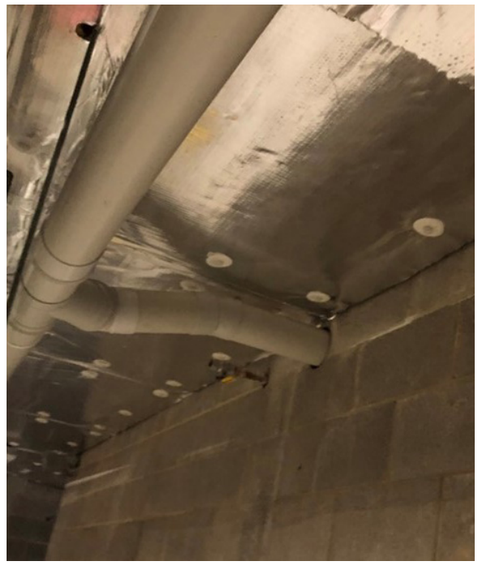
The VBA closed the matter after receiving comprehensive photographic evidence of the rectified work.



Ceiling height above the stairway was less than the minimum 2m

Minimum workspace clearances of the Fire Indicator Panel not met

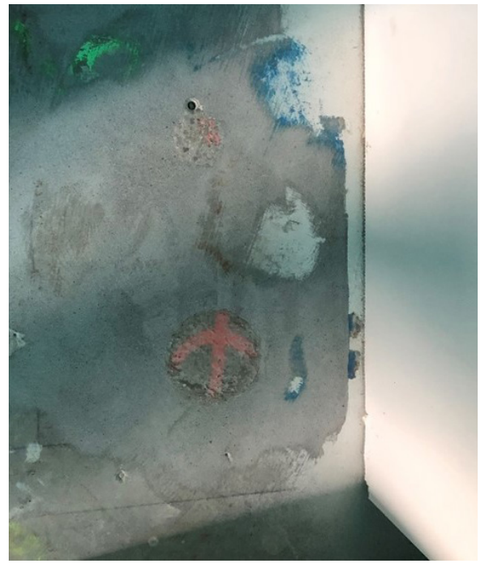
Protection of opening rectifications



Before

After

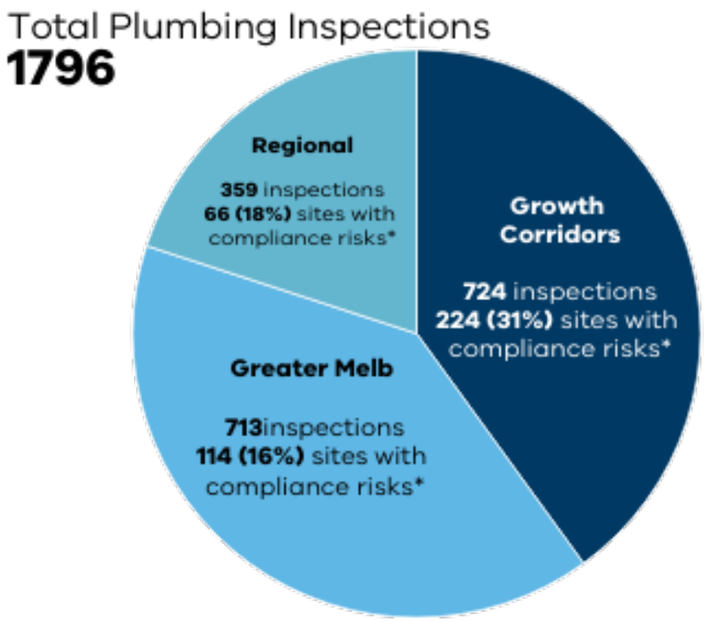
Before

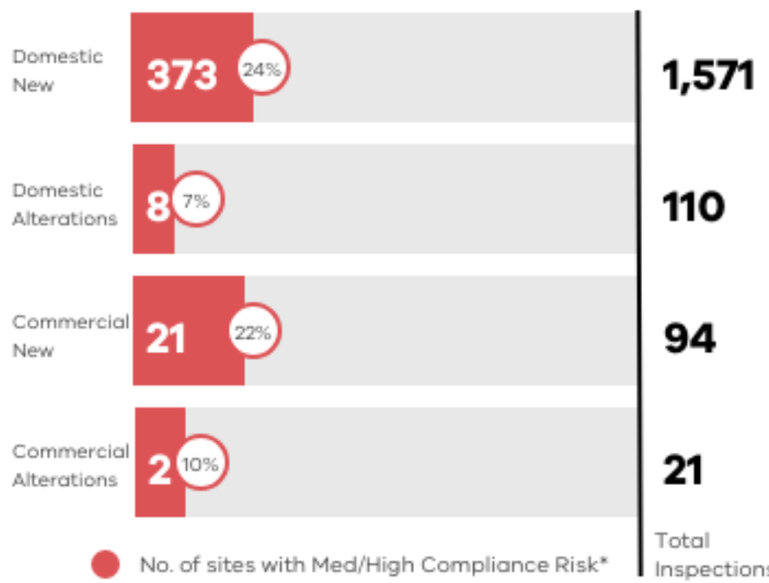


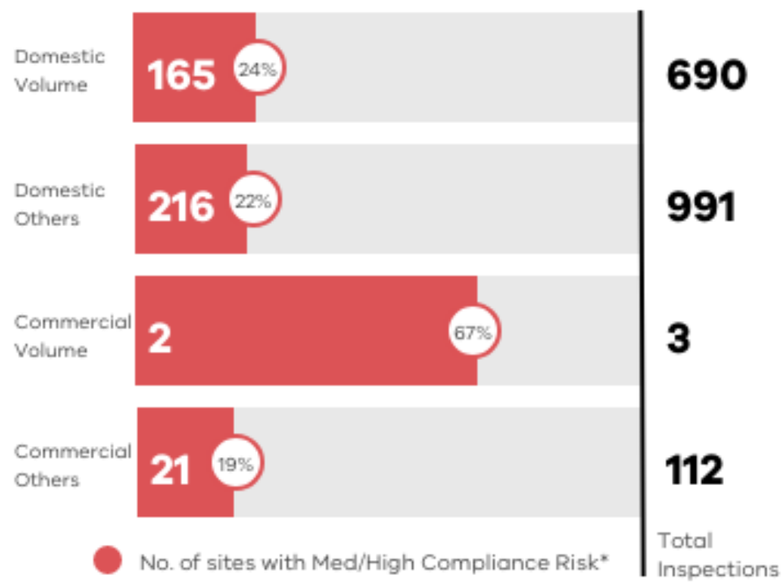
After

4. PLUMBING INSPECTIONS

4.1. OVERVIEW OF PLUMBING INSPECTIONS CONDUCTED IN Q4







GEOGRAPHIC TRENDS

Volume – In Greater Melbourne 'Growth Corridors' in Q4, had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes comparisons – The comparisons across different regions of Victoria provide an interesting trend.

- **Domestic Class 1 buildings –** Higher prevalence of non-compliant plumbing issues were observed on Domestic Class 1 building sites in greater Melbourne 'Growth Corridors' (31%) compared to all other regions of Victoria (15%).
- **Commercial Class 2-9 buildings –** A different trend exists in commercial building sites. Prevalence of non-compliant plumbing issues observed on Commercial Class 2-9 sites in 'Greater Melbourne' (21%) were similar to Greater Melbourne 'Growth Corridor' (19%) sites. Noting the commercial building sample size in Regional Victoria is small.

NEW BUILDS VS ALTERATIONS

Volume – 'New Builds' in Q4 had the highest number of inspections undertaken, where building permit activity is also the greatest.

Inspection outcomes comparisons – Significantly higher prevalence of non-compliant issues are observed during plumbing inspections of 'New' buildings compared to buildings going under 'Alterations' for both domestic and commercial building sites.

LARGE VOLUME BUILDERS VS OTHER BUILDERS

Volume – 'Large Volume Builders', in Q4 had the highest number of inspections undertaken because 'Large Volume Builders' typically build 'New' dwellings in Growth Corridor areas of Melbourne.

Inspection outcomes comparisons – Prevalence of non-compliant issues observed in domestic plumbing inspections of 'Large Volume Builders' is similar to inspections of all "Other Builders". The sample size of commercial plumbing inspections in 'Large Volume Builders' is too small to compare.

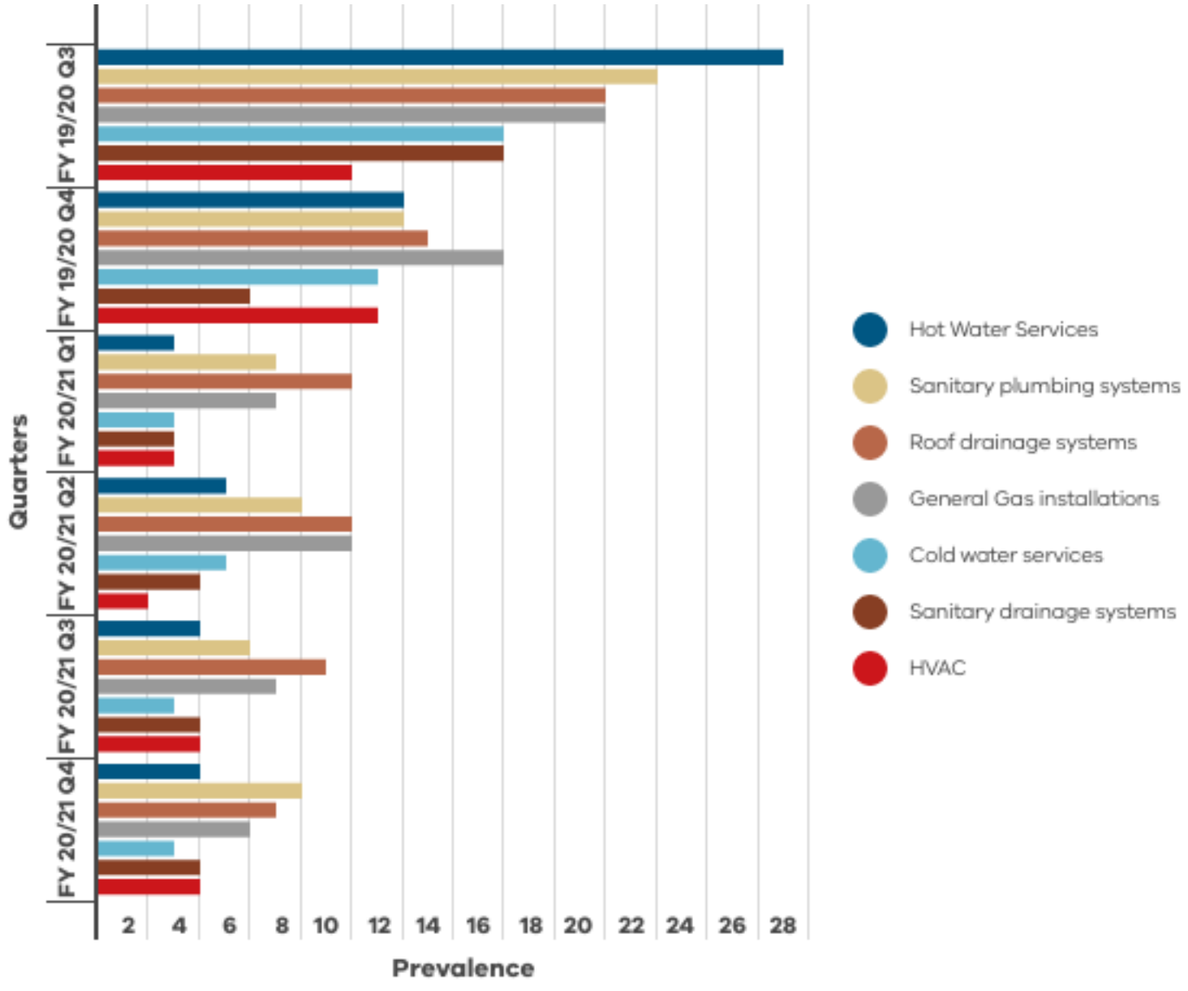
The VBA reviews trends like this to update its risk-based site selection to ensure it selects sites based on the highest risk to the adverse effect on the safety or amenity of future building occupants, and the public.

*Number of sites inspected with at least one medium/high compliance risk observed.

4.2. OVERVIEW OF WHERE THE COMPLIANCE RISKS ARE FOUND

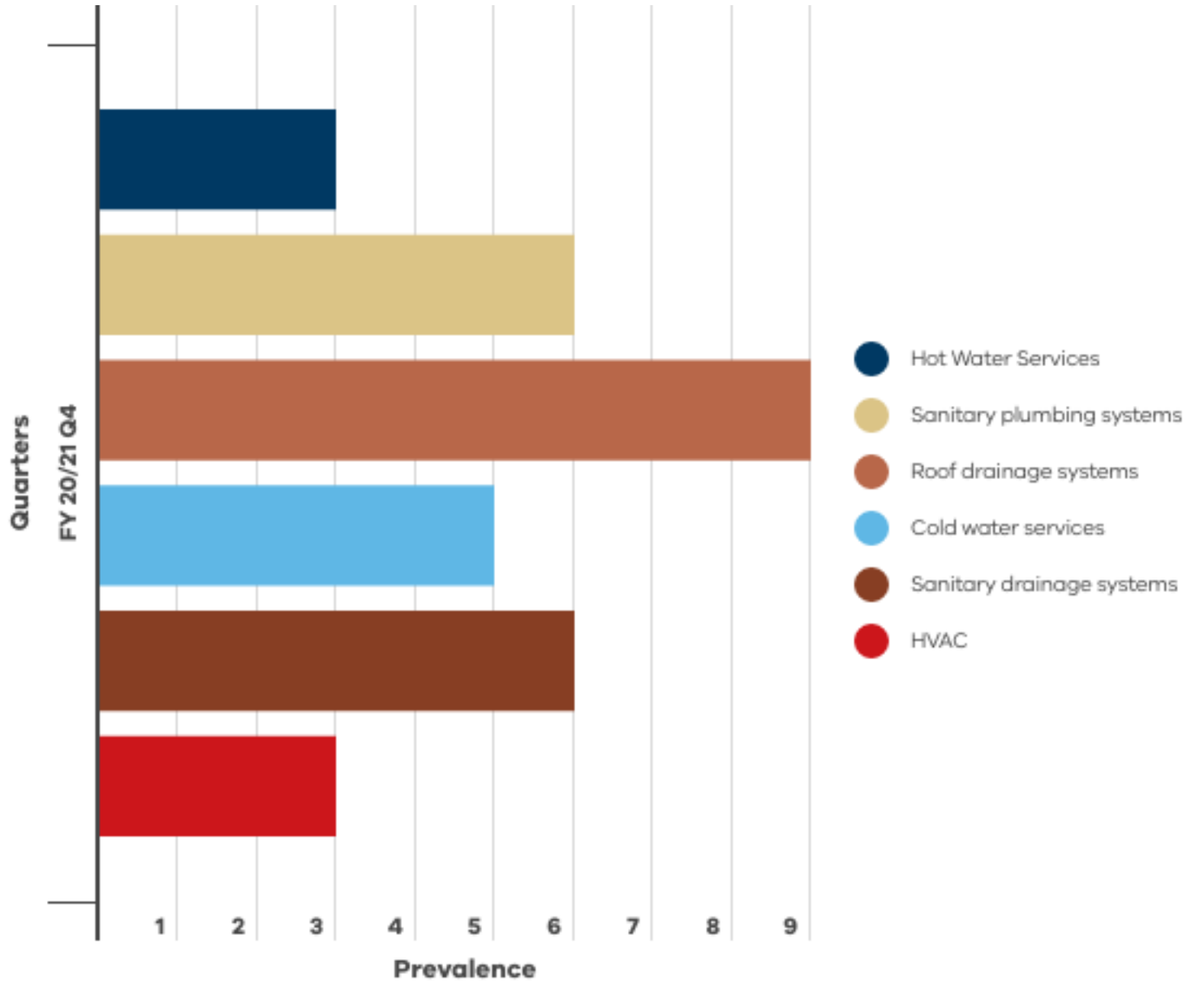
DOMESTIC (CLASS 1)

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



COMMERCIAL

Typically, the sample size of commercial plumbing inspections is too small to report on the most prevalent categories, however, there were 115 plumbing inspections this quarter up from 49 the previous quarter.



Appendix 3 and 4 provides more detailed reporting of the proactive inspections undertaken during the quarter, including information on prevalent compliance risk elements and details of how critical items were rectified.

4.3. OVERVIEW OF PLUMBING COMPLIANCE RISK

DOMESTIC (CLASS 1)

Approximately 18,000 elements were inspected across 1,681 sites (an average of 11 elements per inspection) and 589 elements (across 381 sites) were identified as a compliance risk requiring rectification or justification. 10 critical issues (across 6 sites) were found.

The most serious compliance risks were in the following categories:

EXCAVATION WORK

Excavation works at three unsecured sites had unprotected deep site cuts and included:

- backfill spoil (from an excavation for a below ground drainage) that had been stockpiled to a height exceeding 1.5m in without any protection or isolation of the spoil. This created a fall from heights risk, and
- excavation work for pier drilling that was unprotected and to a depth of 3.3m.

These matters were immediately reported to WorkSafe who attended the site and issued an improvement notice to the building practitioners to rectify.

ROOF DRAINAGE SYSTEMS

At several sites had:

- no overflow provisions in box gutters/rain heads and box gutters undersized and/or reduced in size or discharging into eaves gutter, causing incorrect discharge of roof water and potential blockages at several sites.
- spreaders discharging over flashings, and
- sumps undersized and/or sumps installed as chutes at several sites.

Construction of a single storey dwelling, in the City of Melton had:

- a water pipe installed for an evaporative cooler penetrating the roof without collar flashings,
- the bleed down drain for the coolers was not discharging directly over the downpipe, and
- the eaves gutters were also holding water and did not have the appropriate fall.

Construction of two double storey dwellings, in the City of Maribyrnong had:

- box gutters that changed direction, reduced in size and were fixed to the structure – limiting the expansion and contraction of the gutter, and
- apron flashing were also not fixed to the roof at appropriate intervals and were less than minimum 100mm required.

Construction of a multi-residential development, in the City of Knox had:

- multiple roof drainage issues which included, undersized box gutters that were also installed with insufficient fall, and incorrectly terminated with side shoots instead of sumps or rain-heads, rain-heads incorrectly constructed and pressure flashings fixings exceed the maximum 100mm spacings, and
- roof sheets were also damaged in several locations and lap joins were not fixed appropriately.

DOMESTIC (CLASS 1) CONTINUED

Further examples of issues found in Domestic (Class 1) builds

GENERAL GAS INSTALLATIONS

At several sites:

- no reversion fittings installed on the multilayer gas pipe and multilayer gas pipework exposed to UV, and
- gas and electrical separation issues.

Construction of a new single storey dwelling, in Mitchell Shire had:

- screwed pipe fittings in a non-accessible and unventilated location, and
- installed a gas flue that was less than 500mm above the roof coverings.

Construction of a new single storey dwelling, in Mitchell Shire had:

- gas piping that was not secured appropriately to the structure,
- all open ends of consumer piping not suitably sealed/capped to be gastight, and
- gas appliance flues that were less than 500mm above the roof coverings.

Construction of a new single storey dwelling, in Mitchell Shire had:

- gas pipe work kinked at the top plate, not fixed at required intervals and missing reversion fittings, and
- there was also insufficient separation of gas lines from water services.

SANITARY DRAINAGE AND PLUMBING SYSTEMS AND SUB-SURFACE DRAINAGE

At several sites there were:

- 88° junctions installed on an above ground sewers,
- flat reducer installed on grade,
- junctions installed in exclusion zones,
- no expansion clips used on expansion joints,
- drainage and electrical separation issues, and
- below ground stormwater drains not installed with suitable bedding material

Construction of a single occupancy dwelling, in the City of Wyndham, had multiple issues:

- the below ground sewer and stormwater drains throughout did not have the appropriate bedding/side support material, and
- bends in a below ground sewer were without concrete supports and a below ground sanitary drain had not been subjected to a suitable hydrostatic / air or vacuum test prior to spoil backfill.

Construction of a dual occupancy dwelling, in City of Moreland used:

- 88° junction on the above ground sewers,
- inappropriate pipe supports for an above ground sanitary drain, and
- the expansion assembly had not been installed immediately upstream of the entrance to a vertical stack.

COMMERCIAL (CLASSES 2–9)

Approximately 300 elements were inspected across 49 sites and 39 elements (across 7 sites) were identified as a compliance risk requiring rectification or justification. No critical issues were found.

The most serious compliance risks were in the following categories:

SANITARY DRAINAGE AND PLUMBING SYSTEMS AND SUB-SURFACE DRAINAGE

At several sites there were:

- sewer drains without an overflow relief gully sited, and
- expansion joints compressed not clipped

The sanitary installations of a new two-storey unit complex in the City of Manningham had reflux valves fitted without maintaining a clear space above the valve to facilitate maintenance. AS/NZS 3500.2 2018 cl 10.12.2 (b).

Alterations to an existing dwelling and construction of a new class 2 apartments, in the City of Yarra, had:

- incorrect location of expansion joints throughout,
- above ground sanitary drains inadequately secured and not separated from water services,
- a floor waste gully riser was undersized,
- a junction was installed on the graded section of drain within 450mm of the vertical section, and
- and a ground vent terminated within 3m of an opening to the building.

ROOF DRAINAGE SYSTEMS

At several sites - sumps undersized and with no overflow provision.

Alterations to existing dwelling and construction of a new class 2 apartments, in the City of Yarra had:

- undersized box gutters installed, and
- spreaders that were terminating non-compliantly over flashings, (and missing half end caps).

Construction of a new two-storey dual occupancy dwellings in the City of Wyndham, had multiple issues:

- sumps terminated through side shuts,
- apron flashings were not fixed to the roof at the appropriate intervals,
- the apron flashing upstand was less than the minimum 100mm required, and
- Additionally, sections of the apron flashings were not covered with a hanging flashing, e.g. pressure flashing, grind in flashing or capping.

COLD AND HOT WATER SERVICES

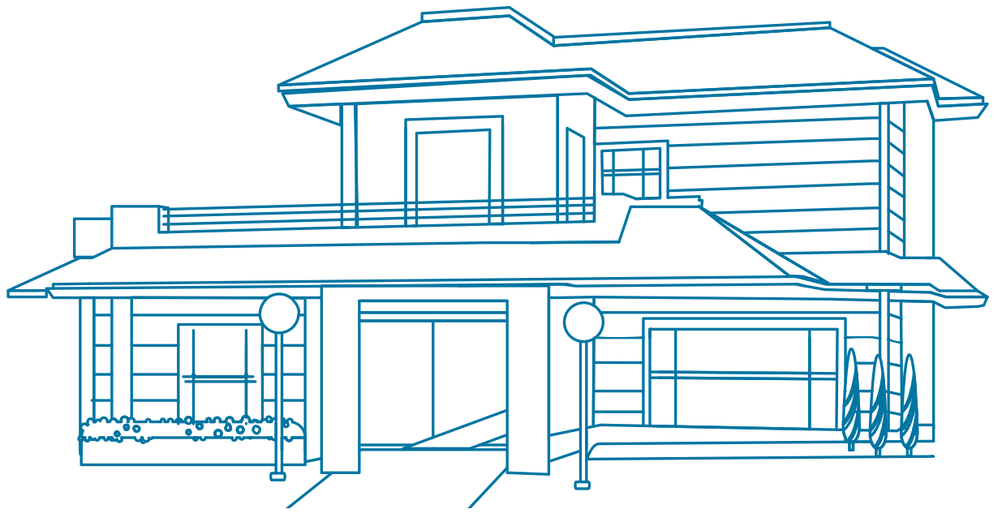
At three sites, missing backflow prevention devices on hand-held shower hoses that could reach shower base and /or toilet.

Construction of a three-storey building and alterations to existing buildings in the City of Port Phillip:

- shower hoses that could reach the inside of the toilet bowl without the required backflow prevention, and
- galvanised bracing was in direct contact with the copper water line.

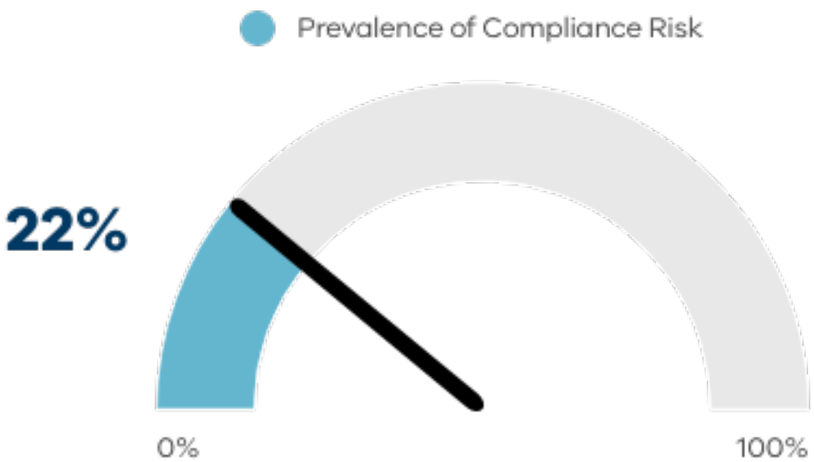
4.4. PREVALENCE OF COMPLIANCE RISKS IN DWELLINGS

SINGLE OCCUPANCY

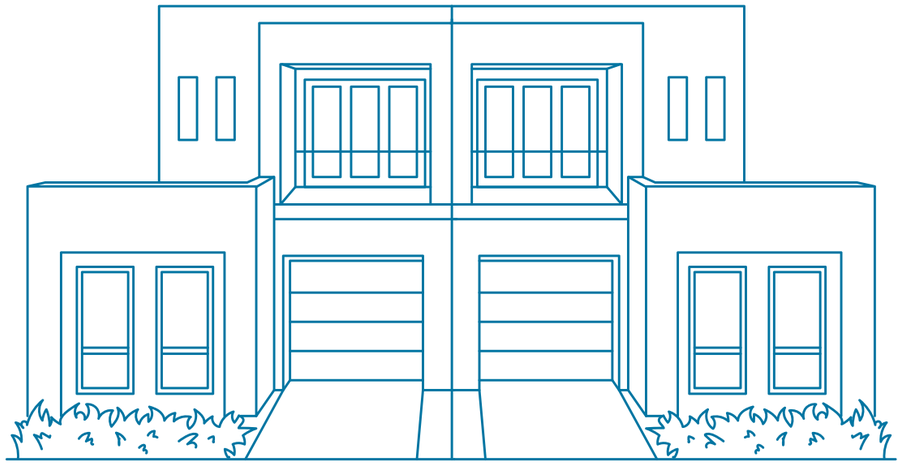


Common Issues

General gas installation
Sanitary plumbing systems (above ground)
Roof drainage systems
Cold water services
Heating, ventilation and air-conditioning systems

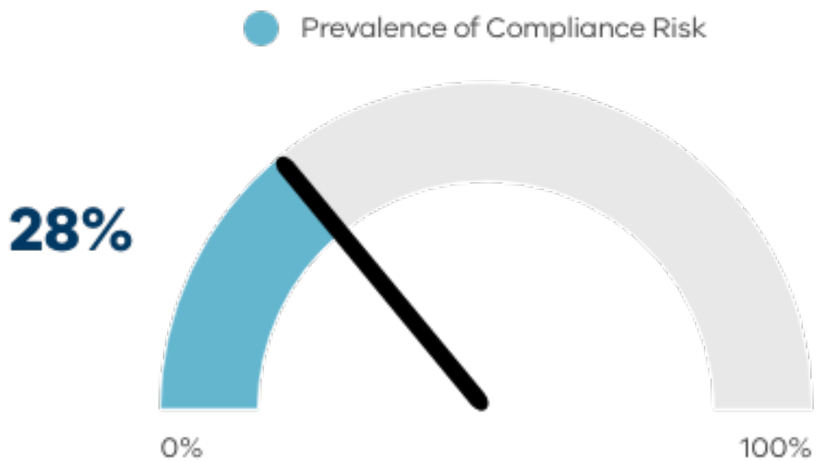


DUAL OCCUPANCY



Common Issues

Roof draining systems
Sanitary plumbing systems (above ground)
General gas installation
Site signage
Sanitary drainage systems



4.5. 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)	**1681**	**23%**	• Roof Drainage Systems • Sanitary Drainage Systems • Sanitary Plumbing Systems • Cold Water Services
Apartments ≥2 sole occupancy (Class 2 + mixed use) and group dwellings and hospitals (Classes 3, 4, 9)	**63**	**29%**	• Roof drainage systems • Sanitary drainage systems • Cold Water Services
Assembly building with no dwellings (Class 9b)	**19**	**22%**	• Roof drainage systems
Office buildings and cafes, shops and markets with no dwellings (Classes 5, 6 + mixed use)	**20**	**0.5%**	• Roof Drainage Systems • Cold Water Services • Sanitary Plumbing Systems • Heated Water Services
Warehouse and factories and carparks – no dwellings (Classes 7a, 7b, 8)	**13**	**0%**	• Nil

4.6. CASE STUDIES

CONSTRUCTION OF A NEW CLASS 1 DWELLING

Inadequate protection from excavation work

Overview

The proactive inspection of a single-storey dwelling under construction identified that excavation works for the below ground drainage resulted in the backfill soil being stockpiled to a height exceeding 1.5 metres without any protection or isolation of the spoil.

This created a fall from heights risk and as the site was unsecured at the time, presented a High risk to public safety and OHS.

Response

The matter was immediately reported to WorkSafe who attended site and issued an improvement notice to the building practitioner to rectify.

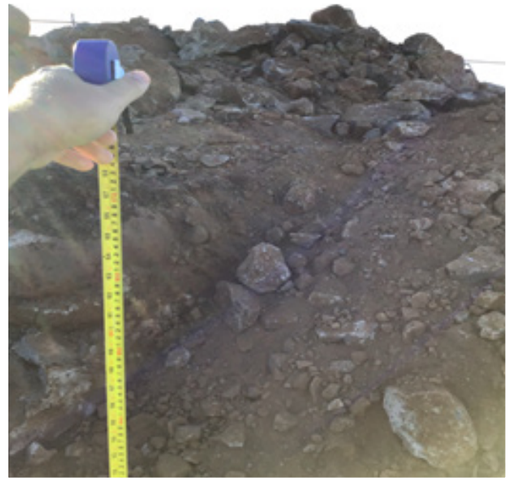
Outcome

The site has subsequently been made safe as per the WorkSafe notice.

The inspection also identified multiple plumbing issues:

i. A below ground sewer drain installed
   - with insufficient grade (not in accordance with AS/NZS 3500.2:2018 Table 3.4.1 6),
   - without enough depth of cover according to AS/NZS 3500.2:2018 clause 3.7.2,
   - with inappropriate backfill material. AS/NZS 3500.2:2018 clause 5.4.4 & figure 5.4.4
   - with inappropriate bedding/side support material. AS/NZS 3500.2:2018 clause 5.4.2 & figure 5.4.4

ii. Storm water drain with inappropriate fill material AS/NZS 3500.3:2018 clause 6.2.10



CONSTRUCTION OF A NEW CLASS 1 DWELLING AND RETAINING WALL

Dangerous site cut

Overview

The proactive inspection of a single-storey dwelling under construction identified the excavation works being conducted for dwelling foundations were not safe because the pier drillings were unprotected and to a depth of 3.3 metres.

Response

The plumbing inspector sought guidance from the VBA's building team who advised him to immediately report the issue to the relevant authorities, due the depth of the site cut.

The Inspector requested works on site to cease and immediately notified WorkSafe and the Municipal Building Surveyor (MBS) of the risk identified.

The MBS attended on the day and WorkSafe thereafter.

Outcome

The building practitioner has now complied with the WorkSafe and MBS directions to ensure the site was made safe.

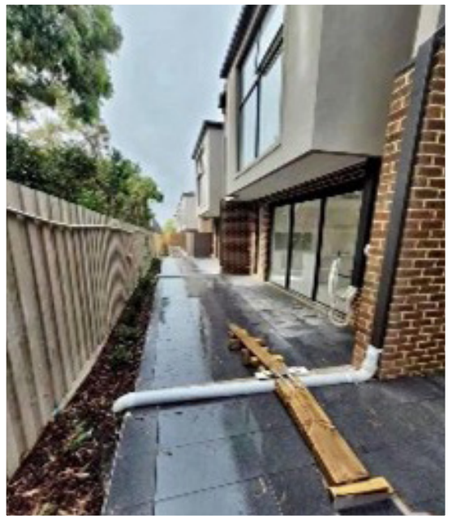
CONSTRUCTION OF A NEW CLASS 1 DWELLING & RETAINING WALL

Multiple issues with roof draining systems, sanitary drainage and plumbing systems

The proactive inspection of 8 three-storey apartments under construction identified numerous non-compliance issues.

SANITARY DRAINAGE AND PLUMBING SYSTEMS - THROUGHOUT THE DEVELOPMENT

- Below ground stormwater drains did not have the appropriate depth of cover. AS/NZS 3500.3:2018 Table 6.2.5 or grade AS/NZS 3500.3:2018 clause 6.3.4.

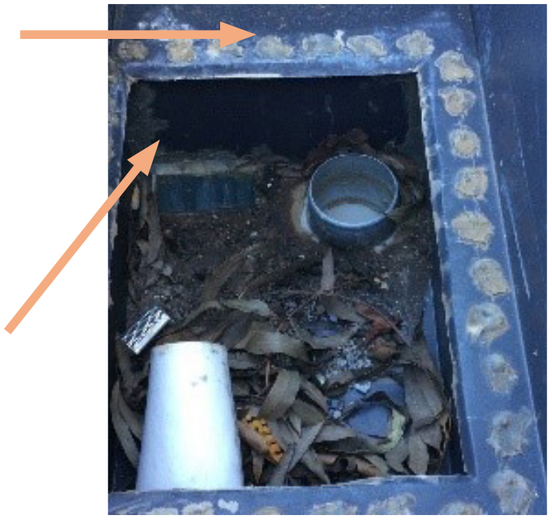


- Suspended sewer does not have appropriate provision for expansion. (AS 2032-2006 Clause 6.4.2.4).
- The drains passing through the footings/walls have not all been appropriately lagged with a suitable material of not less than 25mm. (AS/NZS 3500.2 2018 clause 3.8.2).
- Inspection openings have not been provided for on the below ground sewer where required. (AS/NZS 3500.2 2018 clause 4.7.1)

ROOF DRAINAGE SYSTEMS

- Sumps throughout the development were not appropriately sized in accordance with AS3500.3, with a minimum length of 400m and when fitted with an overflow device with a depth of not less than 150mm as per HB:2015 cl 5.7.2.

- Throughout the development, high-capacity overflow devices for the sump were not installed to the minimum required height), (S/NZS 3500.3:2018 clause 3.7.7.2)
- Throughout the development, sump downpipes are installed too close to the nearest vertical side of the sump. SA/HB 39-2015 clause 5.7.2 (a)



CONSTRUCTION OF A NEW CLASS 1 DWELLING & RETAINING WALL

Multiple issues with roof draining systems, sanitary drainage and plumbing systems

The proactive inspection of 8 three-storey apartments under construction identified numerous non-compliance issues.

ROOF DRAINAGE SYSTEMS

- Box gutters were undersized throughout the development. (minimum 200mm width) A/HB 39-2015 clause 5.3.2 (g).

- Throughout the development box gutters do not terminate into an appropriately sized sump or rain head. (side chutes) SA/HB 39-2015 Clause 5.3.3.

- Downpipes throughout the development from the upper roof catchment were terminated directly into the box gutter. AS/NZS 3500.3:2018 clause 3.4.

- Some spreaders are terminating non-compliantly over flashings and have not been constructed with a half end cap installed. HB 39 2015 cl 5.7.7.

Response & Outcome

While a medium risk letter, sent by the VBA, resulted in the building practitioner sending photographic evidence of rectified work, the evidence was inconclusive and a re-inspection was undertaken by the VBA.

The re-inspection revealed a minimum amount of work had been completed to rectify the work the issuing of an occupancy permit was imminent.

As a result, the VBA investigated if the Certificate of Compliance (CoC) had been lodged, which it had, and led to the CoC being audited by the VBA. The roofing practitioner is currently working his way through all roof plumbing non-compliant items raised.

Due to the difficulties the sanitary plumber is currently having in gaining access to the property, this practitioner's work is yet to be audited. The VBA will continue to pursue the builder to gain access.

5. 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 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, Exist 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 1.5 m Deep, site cut over 1.5 m

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 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: OVERVIEW OF Q4 INSPECTIONS

BUILDING INSPECTIONS

		no of sites inspections	% of inspections per stage		No. Inspections with Potential issues (excludes low risk)	Top 8 categories of non-compliances	Extent of prevalence (% or n)	No. of inspections with Critical issues	Categories of non-compliances	Frequency	Outcome of critical issues
BUILDING	DOMESTIC	**2,012**	Demolition	1%	**665** (33%)	Timber Framing	30%	**43** (2%)	Fire Separation	n24	Documentary evidence confirmed compliance at 16 sites, one site remains unresolved due to a dispute with the RBS on signing off the Fire Separation Wall. Photographic and/or documentary evidence provided to confirm rectification at 7 sites.
			Foundations	9%		Wet Areas and external water proofing	9%		Safe movement (swimming pool access and site entry restrictions)	n9	Items rectified with photographic evidence provided by the builder.
			Footings	11%		Unreinforced brickwork and accessories	8%		Preparation and earthworks	n5	Items rectified with photographic evidence provided by the builder.
			Frame	40%		Footings/slab construction and subfloor ventilation	8%		OHS items	n6	All items actioned the same day then rectified with photographic evidence provided by the builder.
			Lock-up	12%		Fire Separation and Wall Cladding	7%		Protection of adjoining properties	n2	Builder provided evidence of served protection works notices that were already in progress to be served.
			Fixing	19%		Drainage	4%		Footings and Slab construction	n2	Items rectified with photographic evidence provided by the builder, a request for a RBS's passed inspection report is still outstanding at one site.
			Final	13%		Steel framing and Structural Steel members	4%		Set backs and walls on boundaries	n2	Retrospective Report and Consent was obtained by the Builder to allow a reduce set back as per Regulation 79 and at another site the builder is employing land surveyor to confirm height of boundary wall.
			Completed	3%		Earthworks, preparation and protection of adjoining properties	2%		Unreinforced brickwork	n1	Builder provided evidence of rectification.
		2,252 Proactive inspections							Steel framing	n1	Certificate of compliance and certificate of approved inspection by the engineer provided by the RBS sent to the VBA.
	COMMERCIAL	**239**	Demolition	0%	**70** (29%)	Fire Safety Provisions (Fire Fighting Equipment, Construction of Exits and Provisions of escape)	16%	**2** (.08%)	Fire Resistance and stability	n4	RBS confirmed rectification.
			Foundations	4%		Protection of openings	10%				
			Footings	5%		Damp and Weatherproofing	9%		Fire Separation	n1	RBS confirmed rectification.
			Frame	40%		Access for People with a Disability	7%				
			Lock-up	12%		Structural Provisions	5%		Compartmentation and Separation	n1	RBS confirmed timber battens and yellow tongue uses in a concrete wall were only temporary. The RBS is still to confirm compliance with photographic evidence. This item remains opened and the VBA will continue to pursue the RBS.
			Fixing	28%		Compartmentation and Separation	5%				
			Final	8%							
			Completed	3%							

APPENDIX 3: OVERVIEW OF Q4 INSPECTIONS

PLUMBING INSPECTIONS

PLUMBING

DOMESTIC

no of sites inspections	% of inspections per stage		No. Inspections with Potential issues (excludes low risk)	Top 8 categories of non-compliances	Extent of prevalence (% or n)	No. of inspections with Critical issues	Categories of non-compliances	Frequency	Outcome of critical issues
1,681	Demolition	.5%	**381** (23%)	Roof drainage systems	9%	**7** (0.4%)	Site cuts>1.5 m deep/working in trenches	n3	Builder provided evidence of rectification.
	Foundations	11%		General gas installation	7%		Site entry restrictions/affecting public	n2	Builder provided evidence of rectification.
	Footings	12%		Sanitary plumbing systems	6%		Preparation and earthworks	n5	Builder provided evidence of rectification.
	Frame	43%		Sanitary drainage systems	4%		OHS items/site toilet	n3	Builder provided evidence of rectification at two sites, one site work has ceased and a new builder is finishing the project.
	Lock-up	15%		Heated, Ventilation and Air-Conditioning Systems	4%		Heating, Ventilation and Air-Conditioning Systems	n1	Builder provided evidence that item was compliant.
	Fixing	15%		Heated Water Services	4%				
	Final	3%							
	Completed	3%							

COMMERCIAL

115	Demolition	2.5%	**23** (20%)	Roof Drainage	9%	NO CRITICAL HIGH RISK ISSUES TO REPORT IN Q4			
	Foundations	5%		Sanitary Drainage systems	6%				
	Footings	9%		Sanitary Plumbing systems	6%				
	Frame	33%		Cold Water Services	5%				
	Lock-up	6%		Heated Water Services	3%				
	Fixing	25%		Heated, Ventilation and Air-Conditioning Systems	3%				
	Final	19%							

APPENDIX 4: DETAILED VIEW OF NON-COMPLIANT ITEMS

BUILDING INSPECTIONS - DOMESTIC

	Category of compliance risk	No. of non-compliant items in category	Most prevalent issues within the category
DOMESTIC	Timber Framing	**329**	• 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 overhand>30mm • Lintels missing from windows and floor openings
	Wet areas and external water proofing	**53**	• Water stop missing from wet areas (around bath hob beneath bath flange, shower enclosures, wet area thresholds and doors, floor junction of wet areas) • Standard plaster used behind laundry troughs • Timber plates used on balcony are not of H4 or greater treated timber
	Unreinforced brickwork and accessories	**112**	• No Lintel over meter box • Brick ties missing or not attached to studs and expansions ties upside down
	Footings/slab construction and subfloor ventilation	**119**	• Brickwork overhang • Reinforcing steel has exposed in the slab edge • Slab cut for plumbing services
	Fire Separation and Wall Cladding	**93**	• Fire separating boundary wall system not installed in accordance with manufacture installation requirements (no silicone along bottom track, no 20mm 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) • Slab edge is protruding the cladding • Gaps and holes in fire separation system between dwellings
	Drainage	**57**	• Water pooling around foundations • No step down in garages • No overflow provisions on balconies
	Steel framing and Structural Steel members	**47**	• Lintels not galvanised • No structural grout under base plate of columns
	Earthworks, preparation and protection of adjoining properties	**21**	• No allowance made around building perimeter for surface water drainage • Retaining walls required to boundaries - no protection works in place • Site cuts >1.5m without fall protection
	Weatherproofing of Masonry and glazing	**84**	• Sill flashings missing around openings or not installed as required by manufacturer • Damp proof course not extending to full part of walls

APPENDIX 4: DETAILED VIEW OF NON-COMPLIANT ITEMS

BUILDING INSPECTIONS - COMMERCIAL

	Category of compliance risk	No. of non-compliant items in category	Most prevalent issues within the category
COMMERCIAL	Fire Safety Provisions	**39**	• Fire fighting equipment for construction not maintained • Minimum width of 1 m not provided between hydrant and stair balustrading between basement and ground floor Fire isolated stair well. Lack of fire isolated stairway to be justified • Booster assembly located within 10m of the front wall of the building without compliant shield wall. Minimum width of 1 m not provided between hydrant and stair balustrading between basement and ground floor Fire isolated stair well • Exits doors - A single exit from the basement has been provided- to be justified. Alternate exits within 9m of each other contrary to D1.5
	Protection of openings	**22**	• Openings within 3m of boundary • Unprotected pipe penetrations
	Damp and weatherproofing	**26**	• No thresholds at doorways (to bathrooms, units) • No overflow provision provided to external balconies • Inadequate fall for floor wastes in bathroom
	Fire resistance and stablity	**19**	• Timber packer installed into external wall, combustible noggins in external walls • Timber in the steel frame forming the fire rated separation wall • Timber battens installed within steel studs
	Access for people with disabilities	**15**	• Hinge side clearance not provided • Decals not contrasting • Circulation space not provided (2070mm x 1450mm not met) • Tactile indicators missing on stairways
	Structural provisions	**11**	• Stud wall bottom plates missing, no bearing capacity to the perimeter of slab with water gathering under it • Articulation joints not 10mm

APPENDIX 4: DETAILED VIEW OF NON-COMPLIANT ITEMS

PLUMBING INSPECTIONS - DOMESTIC AND COMMERCIAL

	Category of compliance risk	No. of non-compliant items in category	Most prevalent issues within the category
DOMESTIC & COMMERCIAL	Roof drainage systems	**122**	• Several 'box gutter' issues (change of direction, incorrectly terminated, reduced in size and/ or insufficient overflow provision) • Sumps undersized and/or discharge through non-compliant side chutes at several sites • Multiple flashings/capping issues: Pressure flashings applied to unsmooth brickwork. Penetrations in flashings. Barge capping not fixed appropriately. Incorrect fall away from roof on parapet capping. Gaps between over-flashings. Water connections for appliances installed between flashing and roof tiles. Hanging flashing omitted. Undersized flashings. Apron flashings missing upstands, Lead flashing not stepped/flushed. Collar flashings not used for water supply roof penetrations. • Spreaders discharging over flashings, downpipes discharging into eaves gutters
	General gas Installations	**86**	• Insufficient separation of gas piping with other services (electrical and water) • Exposed multi-layer pipe to UV. Gas piping not labelled at gas meter • Reversion fittings have not been installed on the accessible multilayer gas line
	Sanitary Plumbing Systems	**85**	• 88–degree junctions installed on a graded sewer • Expansion joints not independently supported/clipped • Junction in exclusion zone at several sites • Drainage vents installed within 5m of the evaporative cooler
	Sanitary Drainage Systems	**62**	• Min. required separation between Overflow Relief Gully (ORG) and the lowest fixture not met at several sites, ORG for the dwelling is located directly below the concrete slab for the proposed hot water unit. ORG is not protected by concrete mount • The drainage vent is less than 5 meters from the evaporative cooler • Inspection shaft cover is not independently supported • No concrete under 90° drainage bends at several locations
	Heating, Ventilation and Air-Conditioning Systems	**52**	• Insufficient clearance between evaporative cooling unit and drainage vent and flue clearances to combustibles not minimum standards • Evaporative cooling unit water connection installed between roof covering and flashing and condensate drains do not discharge over a down pipe • Refrigeration pipes cut into load bearing wall
	Heated Water Services	**51**	• Solar hot water lines without the required clearance from other services • The solar hot water pipes were not clipped or lagged adequately • Issues with separations between water and other services
	Cold Water Services	**51**	• Water service snot protected through concrete slab • Evaporative cooling unit water connection installed between roof covering and flashing and condensate drains do not discharge over a down pipe. • Issues with separations between water and other services

Plumbing domestic and commercial are combined because the prevalent issues are the same across both these groups