

Proactive Inspections Program

Activity report

January - March 2021

Contents

1.	About	1
1.1.	Benefits	1
1.2.	How we conduct proactive inspections	1
1.3.	Performance year to date	2
2.	Q3 in focus	2
2.1.	What we found	3
2.2.	Action taken by the VBA	3
2.3.	Enforcement activity	4
3.	Overview of compliance risks found	4
3.1.	Detailed overview of compliance risks	6
3.2.	Prevalence of compliance risks in single-and-dual occupancy dwellings	11
3.3.	Prevalence of compliance risks by class	12
3.4.	Prevalence of specific elements - trends	13
4.	Case studies	16
6.	Appendices	19
	PIP risk-rating scale	19
	PIP electronic checklist	20
	Detailed view of Q3 proactive inspections	22

1. About

The VBA's Proactive Inspections Program (PIP) is an early-intervention regulatory initiative that identifies and reduces non-compliant building and plumbing work in Victoria. 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:

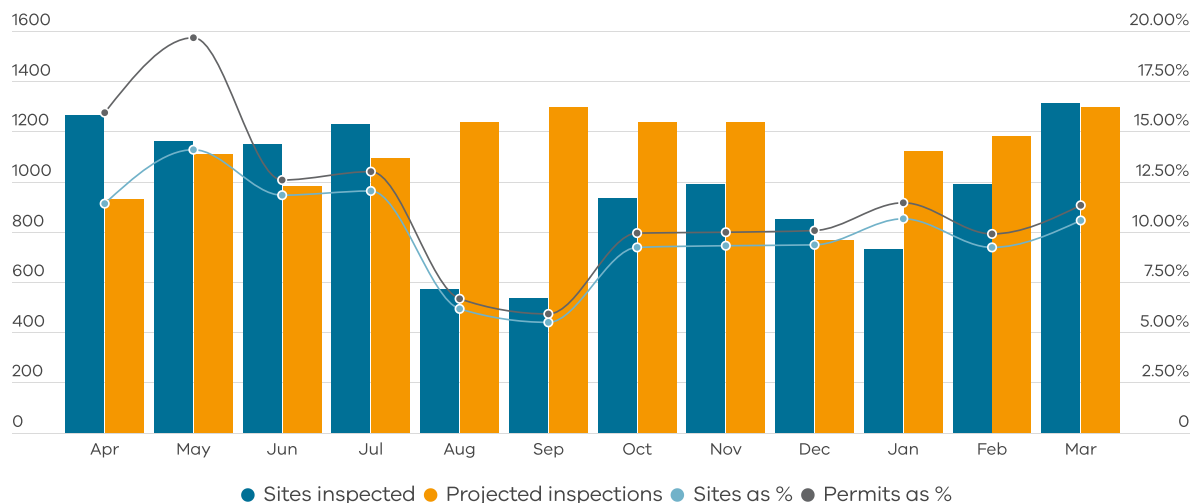
- building and plumbing work broken down into different building stages under the National Construction Code – Volumes 1 and 2 (Building Code of Australia)
- mandatory requirements under the Building Act 1993, Building Regulations 2018 and Plumbing Regulations 2018
- the display of permit information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

The VBA is working with stakeholders to develop guidance summarising key inspection components for particular classes of buildings.

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.



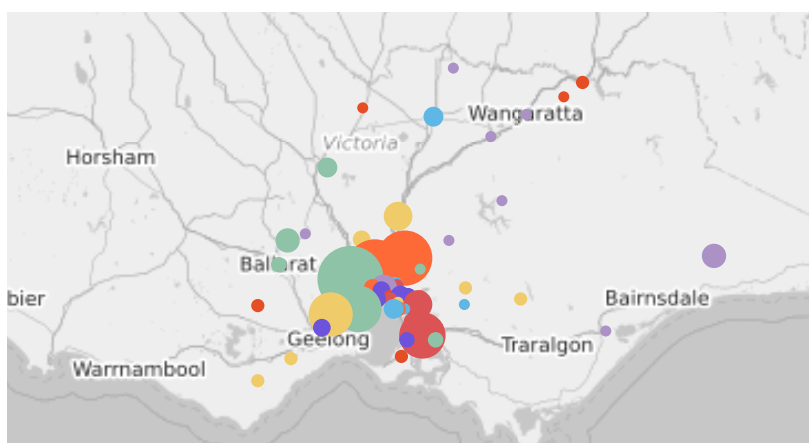
Goal: Inspect 10% of new building permits each year.

Projected inspections are based on full financial year forecast of building permit activity across the State 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 (eg COVID restrictions). See reports for more detail related to activity within that period.

2. Q3 in focus

A total of 3035 inspections (comprising 1732 building and 1303 plumbing inspections) were conducted across 59 municipalities in Victoria, covering 1002 builders and 303 building surveyors across the state. During Q3, the VBA's field work capacity returned to pre-pandemic levels and resulted in an overall increase of 515 inspections compared to the previous quarter (October to December 2020) and an increase of 995 compared to July and September 2020 quarter.

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.



<https://vba.vic.gov.au/building/complaints-compliance-enforcement/proactive-inspections-program/proactive-inspections-program-reports>

2.1. What we found

Thirty-three per cent of inspections conducted during the quarter identified 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 increased by 7% compared to the previous three quarters, which remained consistent at 26%. (This equates to an extra 70 inspections for every 1000 where a compliance risk is observed.)

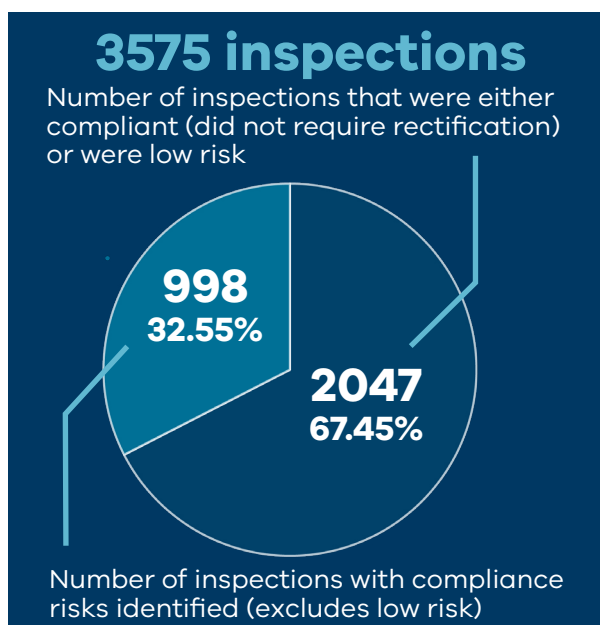
Data on low-risk elements are not included in this report because they are considered unlikely to cause any adverse effects if left untreated. Examples of low-risk items include site signage not being visible, uncontrolled rubbish on site or no on-site toilet.

Critical issues

Two per cent 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 is an increase of 1% compared to the previous four reported quarters (January to December 2020). Sites with OHS risks are reported in this category, with breaches referred to the relevant regulator on the same day.

2.2. Action taken by the VBA

The VBA sent 988 notifications to practitioners requiring them to respond to the compliance risks identified by the PIP.



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.

Typically, these notifications require practitioners to:

- provide all relevant documentation (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.
- demonstrate that the work is incomplete rather than non-compliant and will be resolved as the build progresses or provide the RBS or the VBA with proof the work has been brought into compliance (for example, by forwarding photographs of rectified work).

While some issues can be resolved once the builder demonstrates the work is underway or built under a performance solution, a large proportion of non-compliant work identified by PIP requires rectification. Of the closed inspections in Q3, 82% of the sites required at least one item to be rectified and only 2% of the sites had work still in progress. The balance (16%) of sites inspected, with non-compliant items, were able to provide performance solutions/engineering documents to confirm compliance.

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. In Q2 2020–21, the VBA issued no written Directions to Fix.

3. Overview of compliance risks found

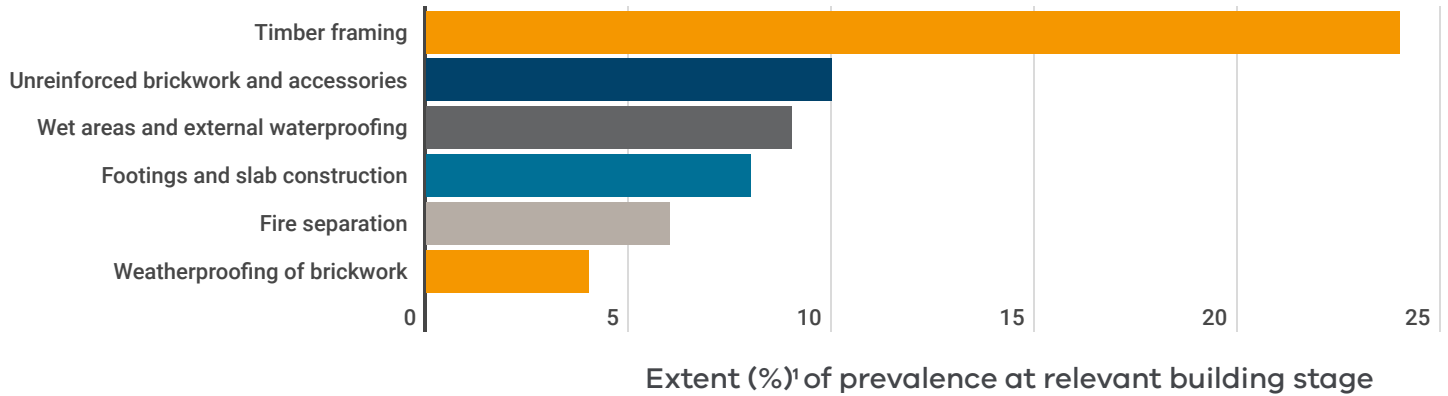
The most prevalent issues (excluding low risk non-compliance risks), fall into the following categories of building and plumbing work:

Domestic

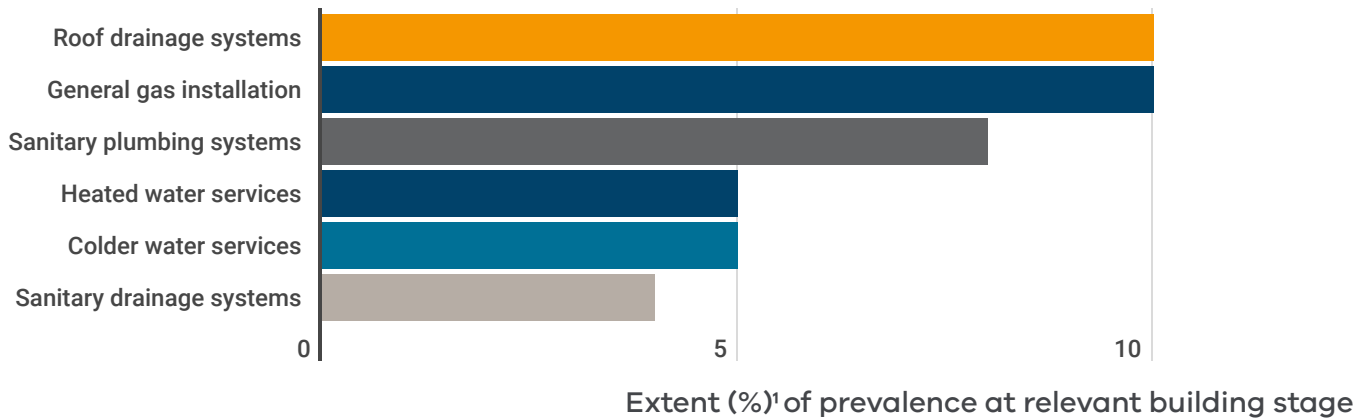
Timber framing items are regularly the top non-compliant issues found by the VBA in domestic building work, and this quarter the non-compliance percentage increased to 24% after dropping to 20% in the previous quarter. Timber framing issues overall have decreased compared to 33% prevalence this time last year. Prevalence of timber framing issues is calculated by summing the number timber framing issues picked up at timber frame stage and lock-up. This decrease in timber framing non-compliances is backed up by feedback from the building inspectors and further by trends analysis on key timber framing items (see previous published Activity Report October to December).

In addition to timber frames being a focus of the VBA's proactive site selection, a key contributor to the high rate of non-compliance in timber framing is the large number of building elements inspected at timber framing stage. The remainder of the top 6 building issues have again largely remained consistent across the past four quarters, and the prevalence of these items typically fall between 5% and 10% each quarter. The top 6 issues in plumbing also remain consistent in each quarter and include:

Building



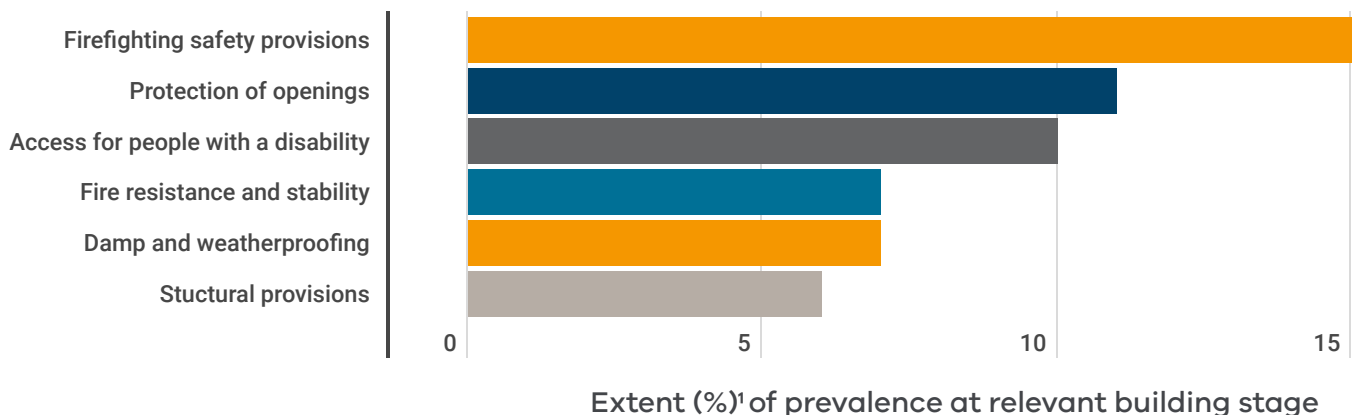
Plumbing



Commercial

Non-compliant issues in commercial building and plumbing work have also remained consistent over the last four quarters, with the six most common categories of non-compliance identified this quarter largely the same this quarter, the difference being the replacing of “compartment and separation” issues with “protection of openings”.

Building



¹ These are approximate percentages only, which are calculated using the building stage most applicable to the area of compliance risk (i.e. the stage at which the item can be most easily viewed for inspection). For example, the percentage figure for timber framing was calculated by dividing the number of inspections with compliance risks identified at the 'frame' stage by the total number of inspections conducted at the 'frame' stage.

Plumbing commercial is not included because the sample size is too small to create statistically significant percentages, however, Appendix 3 outlines the actual number of non-compliant items in the commercial plumbing category).

Appendix 3 also 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.

3.1. Detailed overview of compliance risks

Building

Domestic (Class 1)

Approximately 46,000 elements were assessed across 1643 domestic building sites in Q3 (an average of 28 elements per inspection), of which 1011 elements were identified as a compliance risk and required rectification or justification. Of these elements, 59 were critical (across 50 sites) and required immediate attention. Examples of these issues included:

Fire separation

- Construction of fire separating walls not constructed as per manufacturers guidelines at four sites and included: lack of mineral wool installed at external wall intersections, no channel installed to the end of wall (no fire blanket between cavity of a masonry wall), wall clips that were nailed (not screwed) and only installed to one side of the shaftliner.
- Construction of two townhouses, in the City of Kingston, had used expanded polystyrene (EPS) cladding at the junction with the fire separating wall. As a result of the inspection the EPS panels were removed from these areas and substituted with Loxo Nashasi AAC panels, which satisfy the performance requirements.
- Construction of single storey dwelling, in the City of Greater Geelong, had used timber battens in the construction of a Hebel Panel, (used as a fire separation wall). The builder replaced the battens with 35mm aluminium battens from Hebel instead.

Footings and slab construction

- There were service pipe installation issues at several locations and included exposed pipes at three sites, and service pipes through an edge beam at four sites.
- Construction of double storey dwellings within a new housing estate, in the City of Whittlesea, had multiple issues with slab constructions throughout the site; piers had not been installed in accordance with the engineering drawings and the slabs were incorrectly terminated, (not as per the engineering drawings).
- Construction of 930mm footings in a double storey dwelling, in the City of Hume, were not in accordance with the engineer's design of 1300mm and the bored piers were not poured prior to installation of reinforcement, (in contravention of approved engineering drawing requesting piers to be poured separately to slab).
- Construction of single storey dwelling, in the City of Ballarat, had perimeter trench mesh resting on the foundations due to poor chair installation. As a result, there was no concrete cover in some locations of the reinforcement. A drainage pipe also passed beneath the concrete edge beam without sand cover between the pipe and concrete beam and the steel trench mesh reinforcement was resting on the drainage pipe.
- Construction of a masonry garage wall along the boundary of a double storey dwelling, in the City of Casey, was not supported with a minimum of 150mm edge rebate depth, contrary to AS 2870-2011 and the structural engineer's design.

Drainage

- A balcony in a new double storey dwelling, in the City of Brimbank, was constructed without a threshold/ step down from the dwelling and no overflow provisions. As a result of this inspection the RBS issued a written direction to fix to the builder to rectify these issues.

Temporary pool fencing

- Temporary barriers missing around the construction of swimming pools at nine sites. These serious matters are followed up on the same day for rectification within 48 hours.

OHS (reported to WorkSafe on same day)

Inadequate OHS provisions were identified at three sites during the quarter.

The sites had:

- No fall protection to pool area and a trench >1.5m
- No fall protection openings in platforms/stair voids

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

Commercial (Classes 2–9)

Approximately 1400 elements were assessed across 89 sites (an average of 16 elements per inspection), of which 89 elements were identified as a compliance risk requiring rectification or justification. Of these elements, seven were critical (across two sites) and required immediate attention. The issues included:

Protection of adjoining owners and the public

Excavations at two sites that were affecting the adjoining properties and the public:

- Collapsing soil was undermining adjoining properties car parking areas,
- Right of way at rear of the property was subsiding and affecting paths of travel,
- Not all protection provided, and
- Surface drainage was discharging into a rear excavation, undermining the soil.

Structural

- Construction of three new warehouses and offices, in the City of Whittlesea, had inadequate lateral restraints of joists observed throughout all warehouses.
- Construction of three-storey apartments, in the City of Moonee Valley, used metal suspended ceiling battens as bottom chord restraint to the roof trusses.
- Timber frame construction in a multi-unit development, in the City of Boroondara, had inadequate bearing provided to the Posi struct / timber web connection, (there were gaps greater than 10mm between the between the top chord of the posi structure).

Fire safety provisions and protection of openings

- Construction of new class 2 mixed use apartments, in the City of Wyndham, had inconsistent risers in the fire escape stairs, contrary to Part D2.13 of the NCC 2019 Volume 1, and an electricity meter cupboard constructed of non-combustible material and not suitably sealed against smoke ingress.
- Construction of three new warehouses and offices, in the City of Whittlesea, had excessive travel distances throughout, contrary to clause D1.4 of the NCC Volume 1 2019, and openings within 3m of the fire source feature (side boundary of the allotment) contrary to clause C3.2 of the NCC Volume 1 2019.

Damp and weather proofing

- Bathroom floors throughout a construction of new apartment development, in the City of Moonee Valley, did not comply with F1.11 of Volume 1 of the BCA as the floors were not graded to permit drainage to a floor waste.
- Construction of bathrooms in a new mixed-use apartment, in the City of Wyndham, had no floor waste contrary to Part F1.11 of the NCC 2019 Volume 1.
- The finished floor level (FFL) of the balconies in a 12 unit residential development in the City of Wyndham, were 30mm above the FFL of the apartments, however, the plans observed on site indicated that the balcony FFL should be 100mm below that of the apartment. The RBS issued a building notice to demonstrate how external waterproofing was achieved.

Plumbing

Domestic (Class 1)

Approximately 14,000 elements were inspected across 1254 sites (an average of 11 elements per inspection) and 396 elements (across 377 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:

Roof drainage systems

- No overflow provisions in eaves gutters/ box gutters/rain heads at several sites several sites.
- Box gutters undersized and/or reduced in size at multiple sites or discharging into eaves gutter, causing incorrect discharge of roof water and potential blockages at several sites.
- Apron flashings have been fixed to the roof at intervals exceeding 500mm at several sites.
- Sumps undersized and/or sumps installed as chutes at several sites.
- Two unregistered roof plumbers were found working on a construction of a new single storey dwelling in Mansfield Shire, which prompted them to obtain their plumbing registration.
- Construction of a new dual occupancy dwelling, in the City of Glen Eira, had box gutters terminating into eaves gutters, sumps and eaves gutters without the appropriate overflow provisions and spreaders were receiving more than 15m² of roof.
- Construction of a new single-storey dwelling, in the City of Greater Geelong, had unsupported and undersized flashings resulting in a leaking roof.
- Construction of a new single-storey dwelling, in the City of Wodonga, had roof screws piercing the valley gutters, a soaker flashing installed against the direction of flow and an undersized up stand not finished against the finished wall/fascia appropriately.

General gas installations

- No reversion fittings installed on the multilayer gas pipe and multilayer gas pipework exposed to UV at several sites.
- Gas and electrical separation issues at several sites.
- Construction of a new single storey dwelling, in the Mitchell Shire, had screwed pipe fittings installed in a non-accessible and unventilated location and a gas flue less than 500mm above the roof coverings.
- Construction of a new single storey dwelling, in the City of Whittlesea, had a ducted heating flue not supported independently of the gas appliance and gas piping not secured appropriately to the structure and at the final connections to appliances.

Sanitary drainage and plumbing systems and sub-surface drainage

- Construction of double storey dwelling, in the City of Knox, had 88 degree junction installed on an above ground sewer.
- Construction of a below ground sewer in a new dual occupancy dwelling, in the City of Hobsons Bay, had multiple issues; the appropriate depth of cover according to AS/NZS 3500.2:2018 clause 3.7.2 was not achieved, the sewer bend forming a riser did not have the required concrete support and the appropriate bedding/side support material, and the drain was falling backwards.

- Alterations to a single storey dwelling, in the City of Moreland, compromised the structural integrity of timber framework, due to holes created in the frame for the sanitary pipework.
- Construction of a single storey dwelling, in the City of Greater Bendigo, installed a below ground sewer without concrete supports under any bends or junctions.
- Construction of a single storey dwelling, in Mitchell Shire, had multiple issues: discharge pipes measuring DN50 installed in a below ground sanitary drainage system, flat reducer installed on grade, sanitary vent not supported appropriately, and graded sewer drains not lagged through the concrete slab.
- Construction of a single storey dwelling, in City of Greater Shepparton, had inappropriate grade on drainage vents, (sloping backwards) and the penetrations for these vents had compromised the timber studs.
- Construction of the upstream vent in a sewer of a single storey dwelling, in City of Wyndham, did not have the required 5 m clearance from the evaporative cooling unit on the roof.

Cold and Hot water services

- No backflow prevention on handheld shower hose in shower at several sites.
- Hot and cold-water pipes not separated from other services (gas and electrical) at several sites.
- Cold water pipes not protected as they passed through the slab at several sites.
- Construction of a single storey dwelling, in the City of Hobsons Bay, had multiple issues with cold and hot water pipes. The issues included inadequately lagged pipes through timber penetration, a hot water line without the appropriate minimum clearance of 100mm from electrical and gas lines and maximum clip spacings exceeded on cold water pipes throughout the entire dwelling.
- Construction of a single storey dwelling, in the City of Casey, had water services in contact with the metal bracing which were not appropriately protected.
- Construction of a rainwater tank, in a new single storey dwelling in the City of Yarra, had no of back flow device installed.

Commercial (Classes 2–9)

Approximately 300 elements were inspected across 49 sites and 12 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 systems

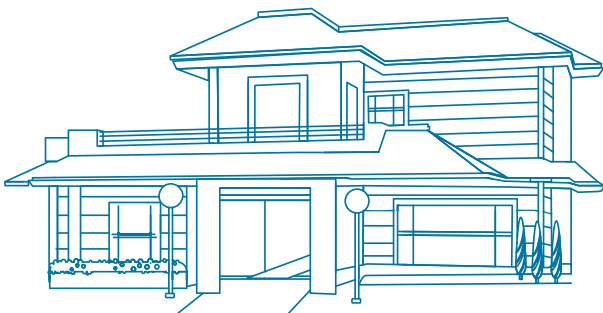
- Construction of six new apartments, in the City of Darebin, had no expansion joints on stacks and sweep junction were used on drainage grade.
- Construction of a sewer stacks, in a mixed-use building in the City of Moreland, had branches from the vertical sections of the stack installed within 600mm below the bend to the graded section of drain. Additionally, there were no expansion joints installed immediately upstream of each change of direction in graded lines throughout the site.
- Stage 1 construction of three dwellings, in the City of Bayside, had no overflow relief gully or a boundary shaft riser installed.

Roof drainage systems

- Construction of roof drainage in six new townhouses, in the City of Moreland, had undersized box gutters installed and spreaders that were terminating non-compliantly over flashings and missing half end caps..
- Construction of roof drainage in six new apartments, in the City of Moonee Valley, had multiple issues. Box gutters did not terminate into an appropriately sized sump or rain head, were fixed at intervals greater than 500mm and the rivet spacing exceeded 40mm. Downpipes from an upper roof catchment terminated directly into the box gutter and 25mm penetration of sisalation into the box gutters was not achieved in several locations. Apron flashing upstands were less than the minimum 100mm required and cappings did not have the minimum 50mm cover over the upright flashings.

3.2. Prevalence of compliance risks in single-and dual-occupancy dwellings

Single occupancy



Prevalence of compliance risks

Building 33%

Plumbing 30%

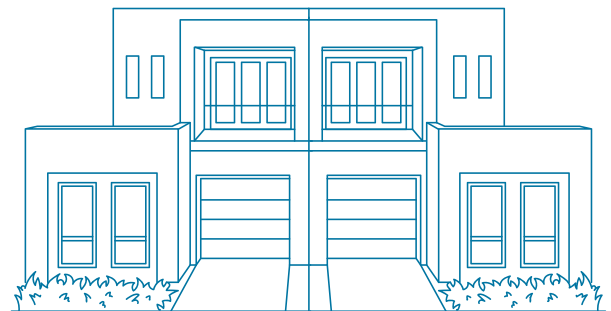
Common building issues

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

Common plumbing issues

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

Dual occupancy



Common building issues

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

Common plumbing issues

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

Prevalence of compliance risks

56% **Building**

38% **Plumbing**

3.3. Prevalence of compliance risks by class

			Areas of serious compliance risk	
Class	No. of sites inspected	% of compliance risks across class	Building	Plumbing
Domestic (Class 1 and 10)	2897	33%	• Timber framing • Unreinforced brickwork and accessories • Wet areas and external waterproofing • Footing and slab construction • Fire separation	• Roof drainage systems • General gas installation • Sanitary plumbing systems • Heated water services • Cold water services • Sanitary drainage systems
Apartments ≥2 sole occupancy (Class 2 + mixed-use) and group dwellings and hospitals (Classes 3, 4, 9)	105	30%	• Protection of openings • Fire resistance and stability • Access for People with a Disability • Fire Fighting Equipment, provision of escape, Construction of exits • Damp and Weatherproofing	• Roof drainage systems • Sanitary drainage systems • Cold water services
Assembly building with no dwellings (Class 9b)	8	38%	• Glazing • Access for People with a Disability	• No inspections
Office buildings and cafes, shops and markets with no dwellings (Classes 5, 6 + mixed use)	13	31%	• Glazing • Building occupied without occupancy permit • Fire resistance and stability • No fall protection	• No inspections
Warehouse and factories and carparks – no dwellings (Classes 7a, 7b, 8)	12	17%	• Openings in platforms/ stair voids • Structural Provisions • Protection of adjoining property • Provision of Escape • Site cuts >1.5m deep	• No inspections

3.4. Prevalence of specific elements - trends

The proactive inspection of plumbing work is in its fourth year of operation and the volume of data accumulated provides an opportunity to discover trends and if common non-compliant plumbing work has improved. The specific common plumbing issues, chosen to track, were selected by consulting plumbing inspectors who have worked in the program since its inception. They were asked about improvements they have noticed on construction sites over the past three years. This is what they have observed:

- **Greater acceptance of the program** – practitioners are more aware of, and more accepting of the program since its inception. Inspectors report that builders are using them as a source of knowledge and are much more eager to ask them questions on site.
- **Quality of certain work onsite has improved** – they report a range of improvements and their top line observations are:
 - Less unlicensed/unregistered workers carrying out plumbing work being identified on site.
 - Roof drainage, box gutters changing direction is much less frequent.
 - Water service, pipes not sealed or lagged through timber penetrations.
 - HVAC, ductwork not supported appropriately (with 75mm supports pm bottom quarter at intervals no exceeding 1.5 metres), less frequent.
 - Sanitary drainage, sweep junctions installed in graded pipework and overflow relief gullys, installed at the incorrect heights less frequent.
 - General gas installations, improved use of gas reversion fittings.
- **Issues and plumbing work requiring improvements include:**
 - WorkSafe and Occupational Health and Safety issues still exist on site.
 - Site signage missing information
 - Separation of electrical and gas services from water services.
 - Below ground sanitary drain support i.e. concrete underneath vertical risers and pipe bedding.
 - Below ground drains incomplete or not ready for inspection at booked time of inspection.

What does the data say?

The prevalence of items (where improvements have been observed) were analysed from January 2018 to January 2021, to discover if the inspectors' observations could be supported by any trends in the data.

Some items showed a significant decrease in their prevalence while others stayed the same or even increased. The prevalence was calculated by dividing the number of inspections with a specific non-compliance risk by the number of plumbing inspections conducted in the same period.

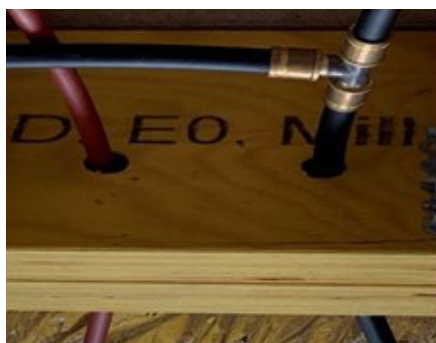
Elements that had an overall decline in prevalence - July 2018 - January 2021

1. Unlicensed/unregistered workers carrying out plumbing work being identified on site



Year	(n) Non-compliant sites	Prevalence
2018/19	9	0.11
2019/20	20	0.17
2020/31 Jan 21	4	0.08
This quarter	1	0.03

2. Water services pipes not sealed or lagged through timber penetrations



Year	(n) Non-compliant sites	Prevalence
2018/19	97	2.0%
2019/20	216	3.1%
2020/31 Jan 21	89	1.2%
This quarter	4	0.3%

3. Box gutters changing direction



Year	(n) Non-compliant sites	Prevalence
2018/19	20	1.1%
2019/20	39	1.1%
2020/31 Jan 21	18	0.9%
This quarter	1	0.07%

4. Sanitary drainage - sweep junctions installed in graded pipework



Year	(n) Non-compliant sites	Prevalence
2018/19	42	1.8%
2019/20	108	3.1%
2020/31 Jan 21	36	1.0%
This quarter	27	1.3%

5. HVAC - ductwork not supported appropriately



Year	(n) Non-compliant sites	Prevalence
2018/19	101	4.4%
2019/20	89	2.5%
2020/31 Jan 21	31	1.62%
This quarter	38	3.7%

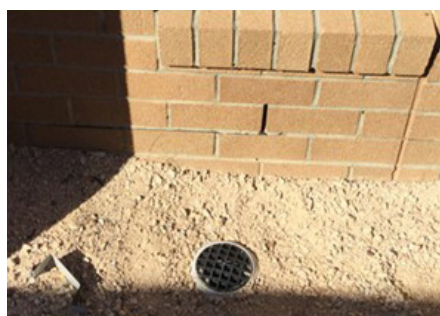
Elements that had mixed result - 2018 - 2021

6. Omission of reversion fittings



Year	(n) Non-compliant sites	Prevalence
2018/19	63	2.8%
2019/20	108	3.8%
2020/31 Jan 21	56	3.0%
This quarter	53	5.1%

7. Sanitary drainage - overflow relief gullies with insufficient clearance



Year	(n) Non-compliant sites	Prevalence
2018/19	19	0.9%
2019/20	10	0.3%
2020/31 Jan 21	15	0.8%
This quarter	5	0.5%

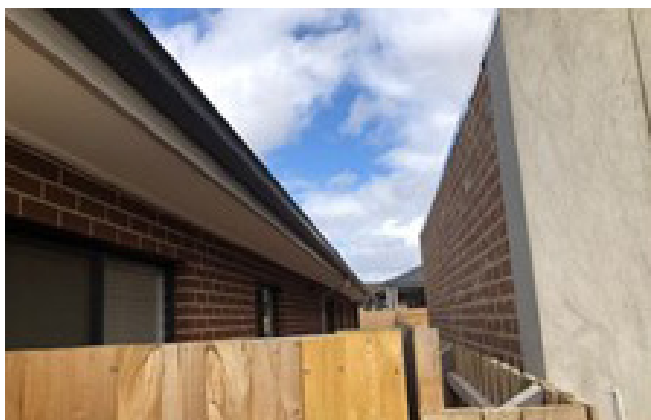
4. Case studies

Construction of a new class 1 dwelling

Required set back from a north facing habitable window

A proactive inspection of a new single storey dwelling revealed the garage wall had been constructed on the allotment boundary in lieu of a required setback of one metre in contravention of the Victorian Building Regulation 82. The dwelling on the adjoining allotment had a north facing windows located within 3m of the boundary.

A medium risk letter was sent to the builder and RBS and building permit documents requested from Melton Council. On receipt of the building permit documents it was apparent that the draftsman, who was also the builder had provided false information to the RBS, noting on the plans the habitable room windows as non-habitable. The RBS issued a building notice to the builder/draftsman who is under investigation for a breach of Section 246 of the Building Act (1993).



Garage wall constructed on the allotment boundary.

Construction of a new class 1 dwelling

Drainage issue

A proactive inspection of a new two-storey dwelling revealed (among other non-compliances) that the living room floor level had been approved and constructed below the adjacent alfresco area, without any consideration of how surface water would be prevented from entering the dwelling.

Uncovering this issue was particularly significant as the RBS had carried out

the mandatory frame inspection and the non-compliance was not identified, (the final inspection was also unlikely to have identified the issue). As a result of the PIP inspection and subsequent medium risk letter sent to the RBS and builder, a performance solution was formulated and approved by the RBS.



Plumbing in a new Class 1 dwelling

Multiple sanitary drainage issues.

A proactive inspection of a single storey dwelling, in the Shire of Indigo, observed multiple sanitary drainage issues (among other non-compliant plumbing work) which included, a suspended sewer without the appropriate support, a below ground stormwater drain without the appropriate bedding/side support material, an above ground PVC stormwater pipe unsupported at the appropriate intervals, and the fitting used for the installation of the storm water drain was not fully inserted. A VBA notification of medium-risk plumbing activity (due to the high number of non-compliant items) sent to the builder, prompted the rectification of the items by the plumber. The VBA closed the matter after receiving notification from the builder that the plumber had rectified the items.



Suspended sewer without the appropriate support.



Above ground PVC stormwater without support at appropriate intervals.



Below ground stormwater drain without the appropriate bedding/side support material



Fitting used for the installation of the stormwater drain has not been fully inserted.

Construction of a new class 1 dwelling

Preparation issue

A proactive inspection of double storey dwelling observed a masonry garage wall (positioned on the boundary of the adjoining property), that was not supported with a minimum of 150mm edge rebate depth, contrary to AS 2870-2011 and structural engineer’s design. The RBS was contacted on the same day due to the seriousness of this issue and acted promptly to partially rectify the item and to complete a variation to the building permit so that the rectification work could commence. The VBA closed the issue upon receiving evidence of the building permit variation from the RBS, the photographs detailing the partial rectification work and an undertaking from the RBS to ensure the matter was brought into compliance.



BEFORE



AFTER

Plumbing in a Class 2 dwelling

Multiple sanitary drainage issues

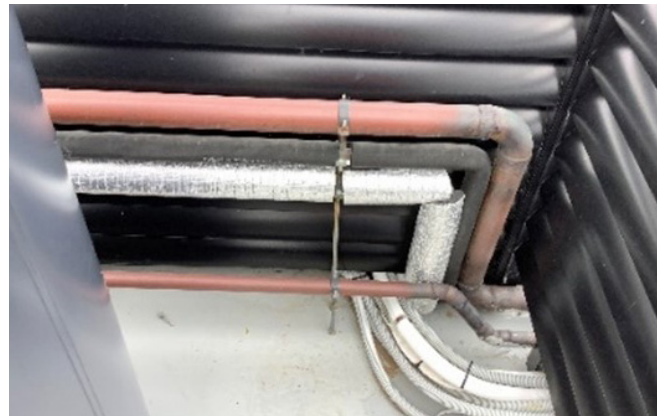
A proactive inspection of a new three-storey apartment complex found multiple plumbing issues, which included ground floor fixtures that were not protected against a surcharge from the main sewer, expansion joints used without fixed supports, drains installed above ground through brick walls without the minimum 25mm annular space around the drain and hot water service clearance from the gas line is less than 100mm. A VBA notification of medium-risk building activity, sent to the builder and RBS, prompted the rectification of the items by the plumber. The VBA closed the matter after receiving comprehensive photographic evidence of the rectified work.



Unprotected plumbing fixtures



Expansion joints used without fixed supports



Hot water service clearance from the gas line is less than 100mm



Drain through brick wall without the 25mm clearance

Construction of mixed-use apartment complex

Inadequate permit documentation & fire engineering report requirements not implemented

The proactive inspection of a three-storey mixed use apartment complex observed more than 20 non-compliant items. The items ranged from inadequate permit documentation, precautions taken for public protection works were installed contrary to the approved consent and the requirements of the accepted fire engineering report were not implemented. There was inadequate fire separation between different fire compartments, exposed slab reinforcement, along with the installation of a combustible external wall contrary to the approved fire engineering report. The external wall subsequently went through to the Building Appeals Board for a determination and further fire engineering was submitted for its approval.

Due to the number of issues, the VBA continued to work with the builder and the relevant building surveyor over several months to ensure all the non-compliances were rectified.

6. Appendices

Appendix 1: Proactive Inspections Program - risk rating scale

Risk rating matrix - 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)

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.

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 – OHS elements

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

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.

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

If these items present an unacceptable risk, the relevant co-regulators are contacted immediately by the building inspector.

Appendix 3 - Detailed view of Q3 proactive inspections

		No Sites Inspected	% of Inspections per STAGE	No. Inspections with Compliance Risk (excludes low risks)	Top categories of non-compliances	Extent of prevalence (% or n)	No. of inspections with Critical issues (OHS items not included)	Categories of Critical issues	Frequency (n)	Outcomes of Critical issues
BUILDING	Domestic	1643	Demolition	0.4%	571 (35%)	24%	50 (30%)	Footing, slab construction and preparation (related to unsupported brickwork on edge rebate and pipe penetrating edge beams)	N19	All issues rectified with RBS reinspection report provided in all but three (still waiting on the RBS's passed inspection report to close)
			Foundations	2%				Fire separation	11	All but one rectified as of 17 May 2021
			Footings	6%		10%		Temporary pool fencing not erected or insufficient/loose	N9	All addressed within 24hrs and one referred to MBS on same day.
			Frame	27%		9%		OHS items and site entry restrictions not sufficient	N5	No safety barriers around trench >1.5m. Openings in platforms/ stair voids and no fall protection - actioned on the same day
			Lock-up	19%		8%		Drainage	N1	Builder rectified issues
			Fixing	33%		6%		Wet areas and external waterproofing	N1	Builder rectified issues
			Final	13%		6%		Swimming pool barriers	N2	Builder rectified issues
								Works without a building permit	N2	One had already been submitted and the other submitted after inspection - practitioner referred to complaints
	Commercial	89	Not commenced	3%	32 (36%)	12%	2 (2.3%)	Protection of the public	N1	Builder rectified issues and one referred to MBS to also monitor
			Foundations	4%				Site cuts >1.5m	N1	Builder rectified issues the next day
			Footings	4%		7%		Protection of adjoining property	N1	Builder provided documentss
			Frame	36%		5%		Drainage	N1	Builder rectified issues by providing a performance solution
			Lock-up	16%		5%				
			Fixing	18%		5%				
			Final	16%		5%				
			Completed	3%						

Appendix 3 - Detailed view of Q3 proactive inspections

		No of sites inspected	% of inspections per STAGE	No of inspections with compliance risks	Top categories of compliance risks	Extent of prevalence (% or n)	
PLUMBING	Domestic	1254	Demolition	0%	377 (30%)	Roof drainage systems - Pressure flashings have been applied to un-smooth brickwork. Soaker flashing is undersized and has not been weathered. Valley gutter has been notched out, reducing its size, and weather fold was removed. Spreaders discharging over flashings and into valley gutter. The valley gutters were screwed to the valley boards not allowing for expansion. Flashing has not been completed in several areas and roof is not watertight. Several 'box gutter' issues (change of direction, incorrectly terminated, reduced in size and / or overflow provision. Sumps undersized and/or discharge through non-compliant side chutes at several sites.	10%
			Foundations	2%		General gas installation - Insufficient separation of gas piping with other services (electrical and water). Reversion fittings omitted throughout a development. Exposed multi-layer pipe to UV in several location. Gas line not supported at required intervals. The tee installed on the multilayer gas line is not an approved method of reversion. Gas holes in frame exceed standards. Flue touching combustibles.	10%
			Footings	2%		Sanitary plumbing systems - 88 degree junctions installed on a graded sewer. Flat reducers used on graded sewers. Wrong location of expansion joints throughout. No backflow prevention at several sites. A sewer branch used in the vertical section of an exclusion zone. Flat reducer on grade. Clip spacing on suspended drain not to required standards. Sanitary vent installed approximately 3.5 meters from evaporative cooler. LIT fittings used incorrectly.	8%
			Frame	36%		Heated water services - Solar hot water pipes did not have the required clearance from other services. (at several sites). Hot water and electrical separation issues. Hot water Solar tank has sunken (installed on an unstable base), is not level and is putting pressure on the associated pipework. Penetrations unsealed. Solar sensor wire is in direct contact with the exposed solar copper line	5%
			Lock-up	19%		Cold water services - Flexible shower arm can reach the floor and backflow prevention is required. Insufficient clearance from electrical services underground. The cold and recycle water pipes entering the house were not protected as they passed through the slab. A 500 kPa pressure limiting valve not installed. A below ground rainwater tank has been installed without a backflow device.	5%
			Fixing	29%		Sanitary drainage systems - Overflow relief gully grate not connected to riser within concrete. The below ground sewer drain is not supported with appropriate bedding material. No concrete support under drainage bends and drainage trap. Zinc coated screws have been installed within the sewer.	4%
			Final	11%		Heating, Ventilation and Air-Conditioning Systems - Electrical conduit installed at the evaporative cooler drain. Condensate drain discharging to eaves gutter. Drain not clipped. Refrigeration pipework not clipped to standards. Evaporative cooler is within 5 meters of the drainage vent. Flue on the ducted heating unit not clipped/independently supported.	3.5%
	Commercial	49	Demolition	0%	8 (16%)	Roof drainage systems - Sumps undersize. Box gutter not discharging to sump, fixings exceeding 500mm. Rivet spacing exceed 40mm. Down pipe spreaders discharging onto flashing and missing end caps in multiple units. Parapet cappings do not fall back to the roof or gutter with a minimum fall of 3°. Screws fixing downpipes to pops are protruding into downpipes catching debris, reducing capacity of downpipes and potential for blockages.	n4
			Foundations	1%		Sanitary Plumbing Systems - Expansion joints on drainage branches missing. Ground floor branch within stack exclusion zone. 88 degree junction used on graded drain. Overflow relief gully missing.	n3
			Footings	1%		Cold water services - Flexible shower arm can reach the floor and backflow prevention is required. Insufficient clearance from electrical services underground.	n2
			Frame	45%		General gas installation - Proximity to below ground power and no marker tape on multi-layer pip exposed to UV.	n1
			Lock-up	16%		Surface and Subsurface Drainage Systems - Debris in storm water drains and pits. Storm water not supported with the appropriate bedding material. Storm water drain in close proximity to below ground power.	n1
			Fixing	28%		Heating, Ventilation and Air-Conditioning Systems - Air conditioner drains not discharging directly over down pipes.	n1
			Final	9%			
				1303 Proactive inspections			

Victorian Building Authority
www.vba.vic.gov.au

© State of Victoria, Victorian Building Authority 2021