



Government of **Western Australia**
Department of **Commerce**
Building Commission

Building
Commission

Builders

Compliance report

A summary of technical building inspection
Mid-year 2016/17



BUILDING COMMISSION COMPLIANCE REPORT

Mid-year 2016/17 REPORT

A summary of technical building inspections



Government of **Western Australia**
Department of **Commerce**

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Front cover: Building Commission image of a ceiling collapse inspected during this investigation.

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1. Introduction

As part of its compliance strategy for registered building contractors, the Building Commission has developed an audit program with the specific objectives of:

- monitoring whether building work is performed in accordance with a class of registration;
- monitoring whether a registered building contractor complies with its registration obligations;
- monitoring compliance with the applicable building standards;
- monitoring compliance with the plans and specifications specified in the applicable certificate of design compliance;
- providing advice and assistance to registered building contractors and practitioners;
- taking action to address non-compliant building work, including referring non-compliant work to the relevant permit authority;
- making recommendations to improve compliance; and
- referring serious non-compliance for enforcement action.

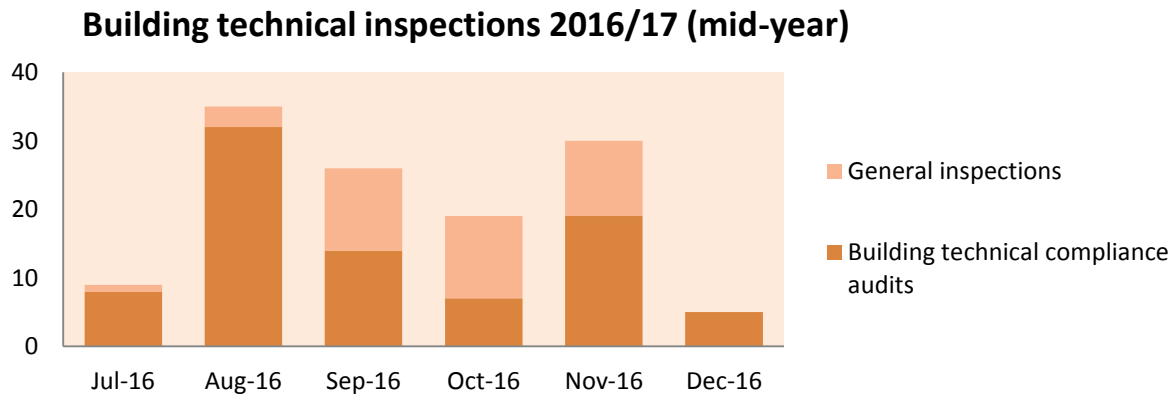
Builder audits undertaken as part of the audit program include an administrative component checking that the building contractor complies with a range of regulatory and administrative requirements as well as inspections of the building contractors building work.

This approach differs from the historical focus of the Building Commission in conducting building inspections, which was largely driven by consumer complaints. While inspections relating to consumer complaints still occur, the more proactive approach taken by the Building Commission will enable it to provide more in-depth information to registered building contractors as well as developing intelligence on areas of building work that may require greater focus when developing future risk-based audit programs.

There are 184 separate elements of building work that a building inspector may assess during an inspection. These range from excavation work to the installation of fixtures and includes meeting bushfire area requirements. In practice, inspectors will only assess a subset of these elements depending on the stage of building work completed and whether any completed work has since become concealed due to later works.

2. Overview

In the six months to 31 December 2016, 124 building inspections were conducted. Of these, 85 were building technical compliance audits and 39 were general inspections. The Building Commission aims to complete 400 building inspections per year as part of the audit program. It is currently on target to complete around 250.



During these inspections, 3,093 separate building elements have been inspected, with 2,190 found to be satisfactory – an overall satisfaction rating of 71 per cent. Building elements assessed as being unsatisfactory are those where the building work does not comply with the applicable building standard or approved building plans.

The satisfactory level is higher than that found in 2015/16 of 68 per cent.

3. Stages of building work

As per the final column at **Appendix A: Elements of Building Work**, building elements have been grouped into the relevant stage at which they are performed in order to provide an indication of the level of compliance during different stages of building work. This stage is determined by the stage of building work at which this element would normally be completed (e.g. work on termite barriers is recorded in the stage to slab completion regardless of what stage of work the building is up to when it is inspected).

Between 2015/16 and mid-year 2016/17, satisfactory levels improved for all stages of building work up until and including roof construction. Of these, the largest improvement was in roof construction, increasing from 63 per cent to 71 per cent. Satisfactory levels for building work between roof construction and lock up as well as finishing work declined.

Table 1: Satisfactory levels for different building stages

Stage	2016/17 (mid-year)	2015/16
Bushfire area requirements	48%	Not assessed
Slab	75%	74%
Plate high	70%	68%
Roof	71%	63%
Lock up	74%	78%
Finishing's	74%	85%
Total	71%	68%

4. Types of building work

Satisfactory levels for the type of building work performed also helps in determining issues in compliance with building standards, especially because in many cases the work within these groupings will be performed by the same subcontractor. The 184 building elements are grouped into 24 separate types of building work, including excavation work, roof tie-down, brickwork and glazing. There has been an improvement in many of the types of building work considered the most risky if not performed to standard. This includes roof tie-down requirements (67% satisfactory from 63%) and timber roof framing (72% from 62%).

Areas where there has been a decline in satisfactory level are mostly areas which are not structural (such as fixture installations and/or where there is a small sample size such as that for timber wall framing).

Table 2: Satisfactory levels for different types of building work				
	2016/17 (mid-year)			2015/16
	Satisfactory	Unsatisfactory	% Satisfactory	% Satisfactory
Excavation work	22	10	69%	82%
Drainage work	1	0	100%	43%
Termite Treatment	25	39	39%	31%
Slab	198	37	84%	80%
Brickwork	799	330	71%	68%
Roof tie-down	193	96	67%	63%
Structural Steel	109	50	69%	66%
Timber Roof Framing	434	170	72%	62%
Timber Wall Framing	5	4	56%	83%
Steel Framing	22	5	81%	93%
Roof Cladding	169	79	68%	67%
Glazing	13	10	57%	68%
Fire Separation	17	5	77%	86%
Bushfire Area	12	13	48%	N/A
Wet Areas & External	13	7	65%	43%
Wall & Floor Finishes	6	3	67%	62%
Ventilation	0	0	N/A	100%
Safe Movement &	3	2	60%	67%
Energy Efficiency	19	5	79%	68%
Internal Render/Plaster	35	9	80%	88%
External Render/Plaster	19	13	59%	82%
Ceilings	53	8	87%	84%
Painting	0	0	N/A	89%
Fixtures	23	8	74%	83%
Total	2190	903	71%	68%

5. Elements of building work – focus areas

There are 184 individual elements of building work that may be assessed as part of a building inspection. While all are important, failure to comply with the applicable building standards carries more risk in some areas than others. For instance, failure to meet roof tie down requirements creates greater risks of a roof being blown off in high winds.

The Building Commission undertook a review of 123 sheet metal-clad and timber frame roofs during 2014. The final report, 'A general inspection into metal roof construction in Western Australia' highlighted a number areas of concerns in the construction of metal roofs in Western Australia.

Table 3: Satisfactory levels for elements of building work - focus areas				
	2016/17 (mid-year)			2015/16
	Satisfactory	Unsatisfactory	% Satisfactory	% Satisfactory
Roof tie-down: Tie Down Straps: Dimensions	82	5	94%	80%
Roof tie-down: Tie Down Straps: Corrosion protection type & mass	41	34	55%	57%
Roof tie-down: Tie Down Straps: Placement	56	29	66%	61%
Roof tie-down: Tie Down Straps: Attachment & appropriate fixings	14	28	33%	49%
Roof tie-down	193	96	67%	63%
Timber Roof Framing - Rafter correctly tied down	44	16	73%	56%
Timber Roof Framing - Rafter other	11	11	50%	79%
Timber Roof Framing - Timber roof battens in 1200 mm edge zone for sheet roofs	16	5	76%	70%
Timber Roof Framing - Timber roof batten general area sheet roofs	14	5	74%	69%
Timber Roof Framing - Metal roof batten	19	4	83%	36%
Timber Roof Framing - Connections: remainder of roof	33	13	72%	63%

Table 3: Satisfactory levels for elements of building work - focus areas				
	2016/17 (mid-year)			2015/16
Timber Roof Framing - Struts	40	24	63%	37%
Timber Roof Framing - Underpurlins	53	10	84%	69%
Timber Roof Framing - Collar Ties	49	7	88%	57%
Timber Roof Framing - Ridge: Rafter to rafter at ridge connection sheeted roof	49	5	91%	83%
Timber Roof Framing - Timber truss correctly tied down	5	5	50%	44%
Timber Roof Framing - Tie down of timber roof beams	22	33	40%	41%
Timber Roof Framing - Timber roof beams other	14	16	47%	61%
Timber Roof Framing - Ceiling Joists	62	3	95%	90%
Timber Roof Framing - Other compliance	3	13	19%	49%
Timber Roof Framing	434	170	72%	62%

While there was an improvement in overall satisfactory levels for roof tie-downs (67% compared to 63%) and timber roof framing (72% from 62%), there was some variation on the changes to satisfactory levels of individual elements within each group.

For roof tie-downs, the largest improvement was in the dimensions for tie-down straps (94% from 80%) while the satisfactory levels of the corrosion protection type and mass and attachment and appropriate fixings declined.

Similarly for timber roof framing, while there was large improvement in the satisfactory level for certain elements, such as metal roof batten improving from 36% to 83% there were a few areas of decline. These mostly related to broad groupings such as timber roof framing – other. If this continues, a detailed look at the issues within these broad groupings will be required.

6. Notes

Reliable data from the Building Commission's building audit program is only available back to 2015/16. As the dataset is increased over time, trends in compliance with building standards will become apparent and enable the Building Commission to proactively address issues before they become systemic (e.g. where common building practices drift away from the building standards or building plans and specifications).

The Building Commission has assessed the consistency in reporting between inspectors through analysis of the inspection data. As part of our quality assurance procedure, the Building Commission holds regular calibration training to aid consistency in inspections and expects this to improve over time.

Appendix A: Satisfactory levels for individual elements

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Unprotected Embankment	3	1	75.00%	1
Other	1	4	20.00%	1
Retaining adequate: Other	18	5	78.26%	1
Excavation work	22	10	68.75%	N/A
Drainage Systems: Water diverted away	1	0	100.00%	1
Drainage Systems: Other	0	0	N/A	1
Drainage work	1	0	100.00%	N/A
Termite System: Durable Notice	1	0	100.00%	1
Termite System: Other	5	3	62.50%	1
Physical barrier placement	19	36	34.55%	1
Termite Treatment	25	39	39.06%	N/A
Finished Work: Footing excavation/ embedment/ foundation material	5	1	83.33%	1
Finished Work : Footings	4	3	57.14%	1
Finished Work: Cracking (acceptable): Other	103	1	99.04%	1
Finished Work - Parging: Other	10	4	71.43%	1
Finished Work - Alignment: Other	55	16	77.46%	1
Finished Work Concrete Paving: Isolation & Control Joints	1	2	33.33%	1
Prep-Work Clean fill: Other	0	0	N/A	1
Prep-Work DPM: Placement - (Note: Slab entirely underlaid)	0	0	N/A	1
Prep-Work DPM: Penetrations	0	0	N/A	1
Prep-Work DPM: Other	0	0	N/A	1
Prep-Work Reinforcement: Bar Chairs	2	0	100.00%	1
Prep-Work Reinforcement: Re-entrant	1	1	50.00%	1
Prep-Work Reinforcement: Cover	1	0	100.00%	1
Prep-Work Reinforcement: Steel lap	1	0	100.00%	1
Prep-Work Reinforcement: Other	0	1	0.00%	1
Second storey Propping: Other - (Suspended slab temporary)	3	1	75.00%	2
Second storey Steel Framing: Other - (Floor trusses)	0	1	0.00%	2
Second storey Set Out: Other - (All Concrete)	5	2	71.43%	2
Second storey Slip Joints: Other	7	4	63.64%	2
Slab	198	37	84.26%	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Workmanship - Built In Frames: Alignment	98	1	98.99%	2
Workmanship -Built In Frames: Attachments	58	4	93.55%	2
Workmanship - Built In Frames: Other	13	5	72.22%	2
Workmanship - Weep Holes:	39	59	39.80%	2
Workmanship - Lintel: Coating & thickness	48	13	78.69%	2
Workmanship - Lintel: Other	9	22	29.03%	2
Workmanship - Utility	42	17	71.19%	2
Workmanship - Coarse/ openings	55	7	88.71%	2
Workmanship - Perpend & Joints	47	32	59.49%	2
Workmanship - Bonding	55	19	74.32%	2
Workmanship - Face	67	23	74.44%	2
Workmanship - Other	6	24	20.00%	2
Technical - Structure	57	16	78.08%	2
Technical - Cavity: Cavity Size	58	0	100.00%	2
Technical - Cavity: Clean	22	27	44.90%	2
Technical - Cavity: Other	2	2	50.00%	2
Technical - Insulation:	10	2	83.33%	2
Technical - DPC: Liquid	0	0	N/A	2
Technical - DPC: Physical	1	0	100.00%	2
Technical - DPC: Other	1	1	50.00%	2
Technical - Flashings: Above openings	18	11	62.07%	2
Technical - Flashings: Below openings	3	14	17.65%	2
Technical - Flashings: Other	12	13	48.00%	2
Technical - Wire Ties: Spacing	20	16	55.56%	2
Technical - Wire Ties: Coating	58	1	98.31%	2
Technical - Wire Ties: Other	0	1	0.00%	2
Brickwork	799	330	70.77%	N/A
Tie Down Straps - Dimensions	82	5	94.25%	2
Tie Down Straps - Corrosion protection type & mass	41	34	54.67%	2
Tie Down Straps - Placement	56	29	65.88%	2
Tie Down Straps - Attachment & appropriate fixings	14	28	33.33%	2
Roof tie-down	193	96	66.78%	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Steel member: Column, roof beams, champher, fixings	40	15	72.73%	2
Steel Member: Corrosion protection	44	2	95.65%	2
Steel member: Tie-downs	23	27	46.00%	2
Steel member: Other	2	6	25.00%	2
Structural steel	109	50	68.55%	
Rafter correctly tied down	44	16	73.33%	3
Rafter other	11	11	50.00%	3
Timber roof battens in 1200 mm edge zone for sheet roofs	16	5	76.19%	3
Timber roof batten general area sheet roofs	14	5	73.68%	3
Metal roof batten	19	4	82.61%	3
Connections: remainder of roof	33	13	71.74%	3
Struts	40	24	62.50%	3
Underpurlins	53	10	84.13%	3
Collar Ties	49	7	87.50%	3
Ridge: Rafter to rafter at ridge connection sheeted roof	49	5	90.74%	3
Timber truss correctly tied down	5	5	50.00%	3
Tie down of timber roof beams	22	33	40.00%	3
Timber roof beams other	14	16	46.67%	3
Ceiling Joists	62	3	95.38%	3
Other compliance	3	13	18.75%	3
Timber Roof Framing	434	170	71.85%	N/A
Roof: Other	1	1	50.00%	2
Walls: Bracing	1	0	100.00%	2
Walls: Insulation - (within and to frames)	0	0	N/A	2
Walls: Bottom plate connection to concrete slab.	1	0	100.00%	2
Walls: Other	0	2	0.00%	2
Connections: remainder of roof	0	1	0.00%	2
Floor: Posts/columns	1	0	100.00%	2
Floor: Joists	1	0	100.00%	2
Floor: Connections	0	0	N/A	2
Floor: Other	0	0	N/A	2
Timber Wall Framing	5	4	55.56%	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Roof: Connections	4	0	100.00%	2
Roof: Tie down - (within and to frames)	3	0	100.00%	2
Roof: Corrosion	4	1	80.00%	2
Roof: Framing dimensions	3	1	75.00%	2
Roof: Other	1	2	33.33%	2
Walls: Framing dimensions bracing	2	1	66.67%	2
Walls: Insulation/ thermal break	4	0	100.00%	2
Walls: Other	1	0	100.00%	2
Floor: Other	0	0	N/A	2
Steel Framing	22	5	81.48%	N/A
Tiles: Other - (installation, fixings- centres, corrosion protection)	2	2	50.00%	3
Roof Sheeting: Fixing, including ridges & hips	37	5	88.10%	3
Roof Sheeting: Penetrations (Flues)	8	2	80.00%	3
Gutters: Other	36	31	53.73%	3
Downpipes: Spacing & Size	52	10	83.87%	3
Downpipes: Location	34	29	53.97%	3
Roof Cladding	169	79	68.15%	N/A
Window Frames: Window labelling	4	3	57.14%	4
Window Frames: Restricted openings 2 storey - (nb NCC Vol. 2 Part 3.9.2.5 Protection of openable windows)	2	3	40.00%	4
Window Frames: Other (Straps to frames).	1	1	50.00%	4
Safety Glazing: Markings	4	2	66.67%	4
Safety Glazing: Other	2	1	66.67%	4
Glazing	13	10	56.52%	N/A
External Walls: Within 900mm - (applicable to Class 1)	8	4	66.67%	2
External Walls: Non combustible materials - (applicable to Class 1)	8	0	100.00%	2
External Walls: Other	0	1	0.00%	2
Separating Walls: Underside of roof covering	0	0	N/A	2
Separating Walls: Other	0	0	N/A	2
Smoke Alarms: Other	1	0	100.00%	2
Fire Separation	17	5	77.27%	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
General: Probe check	1	4	20.00%	0
General: Other	1	1	50.00%	0
Bushfire shutters	0	1	0.00%	0
Subfloor supports	0	0	N/A	0
Floors	1	1	50.00%	0
External walls	3	0	100.00%	0
External glazed elements/ assemblies and external doors	2	1	66.67%	0
Roofs: Roof mounted	0	0	N/A	0
Roofs: General	1	3	25.00%	0
Verandahs, steps, decks and landings	0	2	0.00%	0
Water and gas supply pipes	3	0	100.00%	0
Bushfire Area Requirements	12	13	48.00%	N/A
Waterproofing: Waterproofed areas - (nb wet areas includes balconies)	9	1	90.00%	4
Waterproofing: Floor wall junctions	0	0	N/A	4
Waterproofing: Penetrations in shower	0	0	N/A	4
Waterproofing: Bath to wall	0	2	0.00%	4
Waterproofing: Floor wastes	3	1	75.00%	4
Waterproofing: Other	1	3	25.00%	4
Wet Areas & External Waterproofing	13	7	65.00%	N/A
Wall & Floor Tiling: Workmanship	3	2	60.00%	4
Wall & Floor Tiling: Other	0	0	N/A	4
Floor Tiling: Correct falls to wastes	3	1	75.00%	4
Wall & Floor Finishes	6	3	66.67%	N/A
Ventilation: Exhaust Fan - (nb ducted to outside air)	0	0	N/A	4
Ventilation: Other	0	0	N/A	3
Ventilation	0	0	N/A	N/A
Stairs: Riser & going dimensions	2	1	66.67%	4
Balustrades: Structure, handrails	0	1	0.00%	4
Balustrades: Height and spacings	0	0	N/A	4
Balustrades: Other	0	0	N/A	4
Swimming Pool: Barrier - (nb access, pre 2005?)	0	0	N/A	4
Swimming Pool: Climbable gate and latch	0	0	N/A	4
Swimming Pool: Other	1	0	100.00%	4
Safe Movement & Access	3	2	60.00%	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Insulation: Roof foil installed correctly	9	0	100.00%	4
Insulation: Ceiling insulation	4	1	80.00%	4
Insulation: Wall insulation	6	3	66.67%	4
Insulation: Other	0	0	N/A	4
Building Sealing: Building a conditioned space	0	1	0.00%	4
Building Sealing: Other	0	0	N/A	4
Energy Efficiency	19	5	79.17%	N/A
Internal Float: Render	8	3	72.73%	4
Internal Float, Set: Hardness/Curing/Workmanship	14	1	93.33%	4
Internal Float, Set: Other	4	3	57.14%	4
Linings: Fixings	4	1	80.00%	4
Linings: Workmanship	4	0	100.00%	4
Linings: Other	1	1	50.00%	4
Internal Render/Plaster	35	9	79.55%	N/A
External Render: Ground level finish	13	5	72.22%	4
External Render: Other	3	5	37.50%	4
External Acrylic: Ground level finish	2	0	100.00%	4
External Acrylic: Workmanship	0	3	0.00%	4
External Acrylic: Other	1	0	100.00%	4
External Render/Plaster	19	13	59.38%	N/A
Linings: Fixings	14	4	77.78%	4
Linings: Back Blocking	10	0	100.00%	4
Linings: Workmanship	14	1	93.33%	4
Linings: Other	1	1	50.00%	4
Cornices: Other	14	2	87.50%	4
Ceilings	53	8	86.89%	N/A
Internal Walls	0	0	N/A	5
Ceilings	0	0	N/A	5
Doors - Top and Bottom edges	0	0	N/A	5
Door Frames	0	0	N/A	5
Window Frames	0	0	N/A	5
Skirting	0	0	N/A	5
Architraves	0	0	N/A	5
External Walls	0	0	N/A	5
Eaves	0	0	N/A	5
Fascia	0	0	N/A	5
Gutters & Downpipes	0	0	N/A	5
Painting	0	0	N/A	N/A

	Satisfactory	Unsatisfactory	Percent Satisfactory	Building Stage
Cupboards: Penetration sealing	0	7	0.00%	5
Cupboards: Support & joists, heat source proximity	1	0	100.00%	5
Cupboards: Workmanship	3	0	100.00%	5
Cupboards: Benchtop sealing	0	1	0.00%	5
Cupboards: Other	0	0	N/A	5
Fixing Carpentry: Other	1	0	100.00%	5
Internal Doors: Sanitary compartment - (nb including lift off hinges)	15	0	100.00%	5
Internal Doors: Door to frame gaps/alignment	3	0	100.00%	5
Internal Doors: Furniture	0	0	N/A	5
Internal Doors: Other	0	0	N/A	5
Fixtures	23	8	74.19%	N/A
Total	2190	903	70.81%	N/A

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