

EJE ARCHITECTURE
412 King St, Newcastle
NSW 2300

Date: 4 November, 2024
Reference no: 5258-324C1

Attention: David Roberts

Project: Christchurch Cathedral, Newcastle – Roofwater System Improvement

Introduction

McCallum PFCA are engaged to review the existing roofwater discharge components of the Christchurch Cathedral in Newcastle due to damage to the internal areas of the building caused by the ingress of rainwater via the existing roofwater discharge system.

Engagement Criteria

Our engagement for the project was to provide the following information in relation to the size and calculated performance of above ground items such as eaves gutters, box gutters, sumps, rainheads, downpipes and gutter overflow measures. (Inground pits, pipelines and connections to downpipes did not form part of this engagement)

1. Complete calculations to determine if the existing roofwater discharge system is able to meet the current Australian Standard AS3500.3:2021. [Plumbing and drainage – Part 3: Stormwater drainage]
2. Notify the architect of the items that do not meet the standard due to the age of the building.
3. Review the architects suggested upgrade measures for areas that are not heritage significant for compliance with the current Australian Standard.
4. Liaise with the architect to consider appropriate mitigation measures for the items that do not meet the Australian Standard but are a critical component of the building's heritage.

Throughout the course of the project, McCallum PFCA has provided updated calculations and sketch plans at various times to update the buildings roofwater system for consideration. These have been based on the architect's feedback on what options were achievable and which options could not be considered due to heritage factors.

Results

The result of the coordination process between EJE Architecture and ourselves has resulted in a hybrid system of roof drainage. Some aspects are compliant with the current Australian Standard and other items are not. However, the items that are non-compliant are in areas that are unlikely to result in further ingress of roofwater into the Cathedral's internal areas.

Items that have been incorporated into the proposed amendments to the roofwater drainage system include the following:

1) Additional Rainwater Heads (at the following locations)

- The Nave
- The Chancel roofs
- The North and South Aisles
- The Warriors' Chapel
- The Vestries.

2) Installation of overflow devices on all rainwater heads

- Over the top weir via an opening in the hood cover
- Into the body of the rainwater head

3) Rationalisation of downpipe and spreader locations in problem areas

- Downpipes in problem areas of previous system failure discharge to lower roof areas via pipelines in lieu of a cascading box gutter system.
- Downpipes from upper roofs previously discharging via spreaders onto buttresses have been redirected clear of these items and spread onto roof sheets and then flow to eaves gutter system.

4) Additional Back Flashings

- The architect has elected to retain the existing heritage eaves gutters. Whilst the size of the gutters and the number of downpipes are not compliant with the current Australian Standard, we understand that the architect has elected to recommend the installation of a continuous back flashing to provide additional protection to the underlying fabric.
- This should result in any rainwater that the gutters are unable to capture overflowing over the front of the eaves gutter to ground level.

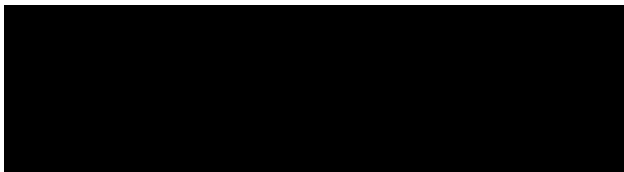
Conclusion

Not all of the roofwater drainage system rectification measures proposed by the architect are compliant with current Australian Standard requirements for the discharge of rainfall from roof areas.

However, the system proposed is based on the latest rainfall data available. The intention of which is, in the event of an overflow situation, the rainwater will cascade via the roofs to ground level.

We believe that the measures that have been documented to be implemented will greatly improve the present roofwater discharge system efficiency and lessen the likelihood of future damage caused by the ingress of rainwater into the building.

Regards



Robert McCallum (Director)

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