BUILDING MATTER **Roof Design using a Box Gutter System**

This Final Report and/or Performance Solution is not valid if applied to non-genuine Dam Buster imitation copies. Dam Buster patented products have name plate ID and / or serial number ID as well as unique security features known only to Dam Buster. Patent and Intellectual Property infringers will be vigorously pursued.

PROJECT ADDRESS

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PROBLEM – Deemed to Satisfy (DtS) box gutter solution is not suitable for roof layout and / or is not aesthetically acceptable

Available DTS box gutter solutions provided in AS/NZS 3500.3 are not suitable for this project in one or more locations, as discussed in the Performance Based Design Brief.

SOLUTION – Use of proprietary box gutter devices

It is proposed to use the following **Dam Buster®** box gutter device(s) in lieu of the DtS box gutter solutions specified in AS/NZS 3500.3.

a) Box gutter overflow devices

- **Dam Buster®** Rainhead
- **Dam Buster®** Side Outlet* and Rainhead combination
- **Dam Buster®** Side Outlet* and Sump combination
- **Dam Buster®** Sump and **Dam Buster®** Continuous Sump & **Dam Buster®** Back-to-Back Sump

  * T Side Outlet, End Side Outlet, Corner Side Outlet, and Cruciform Side Outlet

Note - cross out devices not used

NOTES

1. Box gutters discharging to **Dam Buster®** box gutter overflow devices must be designed for free flow (in both the normal flow and overflow conditions), in accordance with Appendix H, Figure H.1 of AS/NZS 3500.3, for flows between 3 L/s and 16 L/s. All box gutters with calculated flow rates lower than 3L/s must be designed for a minimum of 3L/s.
2. In the normal flow condition, the **Dam Buster®** rainhead is fully compliant with AS/NZS 3500.3.
3. Testing of the **Dam Buster®** in the overflow condition was carried out by the AHSCA Research Foundation, and each rainhead was determined to have an overflow capacity exceeding 16 L/s.
4. Further to Note 1, all box gutters discharging to **Dam Buster®** devices can be designed 'independently'* of the **Dam Buster®** device in accordance with AS/NZS 3500.3 and are therefore considered to be 'Deemed-To-Satisfy' Solutions (when correctly designed and installed). Consequently, compliance is achieved in accordance with NCC Governing Provision **A2G4 *A combination of solutions***, where:
   - The box gutter(s) is **Deemed-to-Satisfy**
   - The **Dam Buster®** device(s) is a **Performance Solution**

   * The AS/NZS 3500.3 DTS Sump and Side overflow device, and Sump / High-capacity overflow device, are designed integrally with the box gutter(s) because, in the overflow condition, backwatering must occur in the box

gutter(s) itself i.e. the flow within the box gutter is no longer 'free flow' (as it is in the 'normal flow' condition').

5. The **Dam Buster®** Side Outlet may only be used in combination with a **Dam Buster®** Rainhead or the AS/NZS 3500.3 DTS rainhead or the **Dam Buster®** Sump. Similar to the **Dam Buster®** Elbow, the four types of **Dam Buster®** Side Outlets incorporate a specific step-down dimension to facilitate a change in direction of one or more box gutters and are hydraulically similar to the **Dam Buster®** Elbow and **Dam Buster®** Junction.

b) Change of direction in box gutter (not an overflow device)

- **Dam Buster®** Elbow
- **Dam Buster®** Junction**

** Tee Junction and Corner Junction

Note - cross out devices not used

NOTE

The **Dam Buster®** Elbow and **Dam Buster®** Junction devices incorporate a specific step-down dimension and are effectively sumps with one open side. Hydraulic analysis by Dam Buster's Expert, and testing, demonstrates the step-down more than compensates for the energy loss in the bend, and consequently backwatering cannot occur in the upstream box gutter. The upstream box gutter(s) discharges into the 'open sided sump' and is designed in accordance with Figure H.1 of AS/NZS 3500.3 using the design flow rate (refer to the Product Technical Statement for the design methodology). Note, it is not necessary to design the downstream box gutter, which will automatically have sufficient depth due to the step-down.

Proposed roof drainage installation plans

Refer to the attached plans showing the proposed location of **Dam Buster®** products

Details / numbers of attached plans / sketches:

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Evidence of Suitability of Dam Buster® products www.dambuster.com.au

Refer to the **Dam Buster®** website for the current versions of the following documents:
Dam Buster® – Product Technical Statement
Dam Buster® – Evidence of Suitability*

* Refer to Appendix A '***Technical Appraisal of the Dam Buster Roof Drainage System***', prepared by Adjunct Associate Professor Dr Robert Keller. This document includes a detailed comparison of Dam Buster's devices with AS/NZS 3500.3.

Installation

Refer to the **Dam Buster®** website for the current version of the following document:
Dam Buster® - Installation manual

Additionally, where required by relevant regulatory body and / or legislation, the installation must comply with SA HB39 *Installation code for metal and wall cladding*.

Relevant Performance Requirements (BCA Volume 1)

Part F1 Surface water management, rising damp and external waterproofing.

Performance Requirements

F1P2 Preventing rainwater from entering buildings
Surface water, resulting from a storm have an *annual exceedance probability of 1%*, must not enter the building.

Limitations

F3P2 does not apply to-
(a) a Class 7 or 8 building where in the particular case there is no necessity for compliance; or
(b) a garage, tool shed, *sanitary compartment*, or the like forming part of a building used for other purposes; or
(c) an *open spectator stand* or *open-deck carpark*

Relevant Performance Requirements (PCA) Tasmania

Tas Section E3 Stormwater – Roof drainage systems

Performance Requirements

Tas E3P1 Roof drainage systems
(a) A roof drainage system must have a capacity to transfer the volume of water Box and valley gutters must have a capacity to transfer the volume of water anticipated in a 1% *annual exceedance probability* rainfall event

(b) The *annual exceedance probability* must be appropriate to-
(a) The importance of the building
(b) The severity of potential damage to the building
(c) The severity of potential damage to property, *loss* of *amenity*, illness, or injury that would result from the failure of the system
(c) anticipated in a 5% *annual exceedance probability* rainfall event.

Tas E3P2 Overflow
(1) A roof drainage system must provide an overflow device suitable for a 1% *annual exceedance probability* rainfall event.

Tas E3P3 Watertightness
(1) All internal roof drainage components must be *watertight.*

Tas E3P4 Design, construction and installation

(1) A roof drainage system must ensure that-
  (a) stormwater is transferred to a *Network Utility Operator's* stormwater system or an *approved disposal system;* and
  (b) appropriate access is provided for maintenance and clearing *blockages.*

(2) A roof drainage installation must avoid *blockage* and *uncontrolled discharge* causing-
  (a) *loss* of *amenity*; and
  (b) *loss* to building and property.

(3) A roof drainage installation must avoid foul air and gasses accumulating in the roof drainage system.

Final report prepared by the relevant building practitioner as permitted by the State or Territory for the building classification to the NCC

Name: _____

Building practitioner type: _____

Company: _____ Phone No: _____

Registration Category: _____ Registration # _____

Signed: _____ Date: _____

Attached – Performance Based Design Brief.