

13 July 2016

## Guidelines for Design of Valley Gutters

Reference is made to the Australian Standard AS 3500.5.12:2012 for the maximum rainfall intensity anticipated in a 100 year period. For South East Queensland, the maximum defined is 330mm/hr. Building codes require that valley gutters have drainage capacity to contain this maximum without leakage.

Australian Standards advise the following about valley gutter design:

- Roof slopes not less than 12.5 degrees
- Valley gutter side angle 16.5 degrees
- Catchment area shall not exceed 20m<sup>2</sup>
- 100 year rainfall intensities less than 300 mm/hour may use girths < 400mm

Latest Building Code NCC 2016 specifies the following about valley gutters:

- Roofs with pitch more than 12.5 degrees must have width of not less than 400mm and be wide enough to allow the roof covering to overhang not less than 150mm each side of the gutter
- Roofs with pitch less than 12.5 degrees must be designed as a box gutter

Figure 1 shows the effective cross sectional areas of 3 valley gutter options.

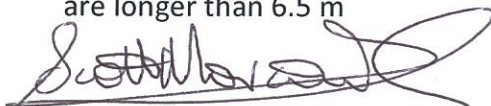
Pantex has tested the performance of its 0.4 x 400 girth profile as follows.

Test work was carried out with a Colorbond roof at pitch 22.5°. The valley opening width between the sheet ends was 70mm. 18mm thick valley boards and Pantex Roofing Systems 40mm battens were used. Water discharged by the valley was 1.83 l/s representing the total rainfall in a 100 year storm event over 20m<sup>2</sup> of roof. The valley gutter easily drained this volume of water, with no leakage whatsoever.

In other test work where splashing and or frothing was induced in the water flow it was observed that a small amount of water splashed outside the valley gutter. This is representative of conditions which exist in a tropical storm with strong gusting winds or where debris has fallen on a roof.

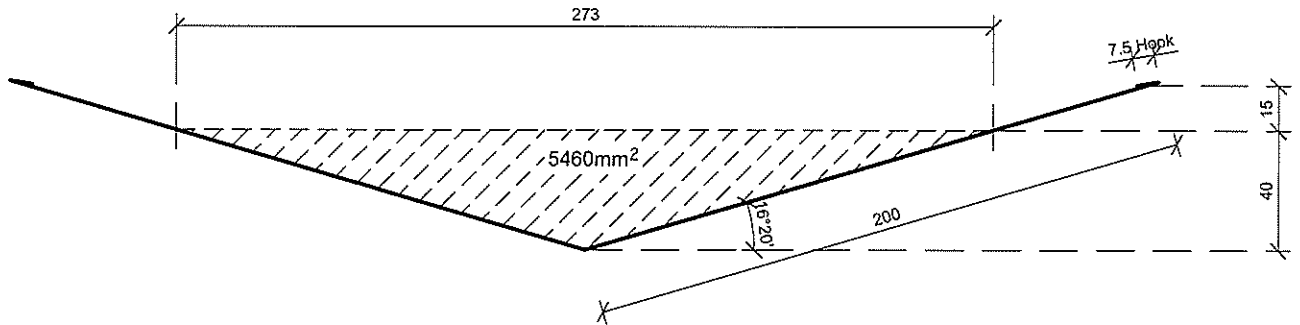
Pantex advises the following:

- Valley gutters should only be used for roof slopes greater than 12.5 degrees
- **0.4 x 400 girth valley gutter** has 188% more capacity than that referenced in the Australian Standards AS 3500.3:2015 but does not conform to the Building Code NCC 2016 3.5.2.4 (d) (i)
- **0.55 x 450 girth valley gutter** conforms to building code and Australian Standards
- Roof drainage area maximum of 20m<sup>2</sup> is typically exceeded when valley gutters are longer than 6.5 m

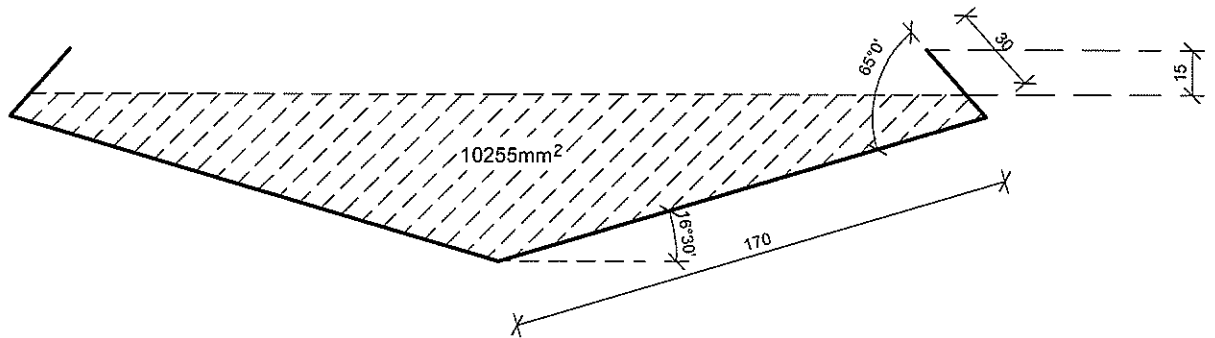


Scott Morcombe  
Business Manager

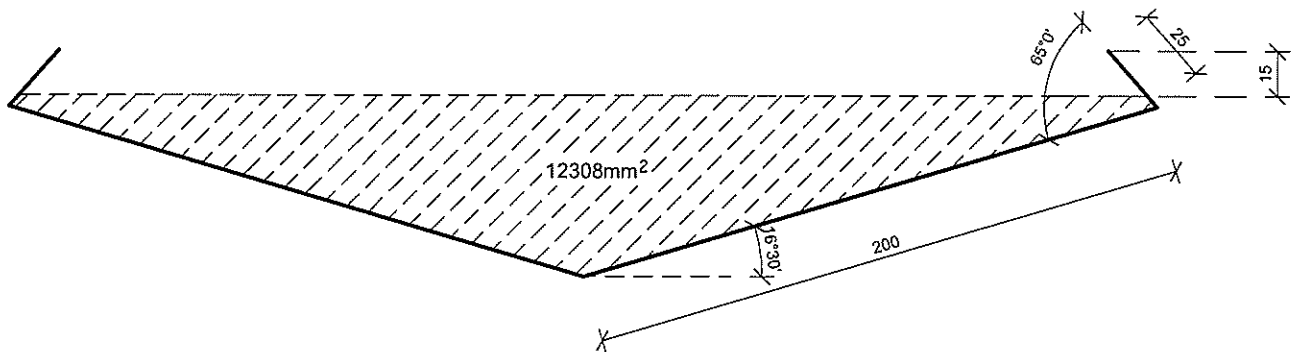
**Figure 1. Valley Gutters**  
**Effective Cross Sectional Areas**



**AS/NZS 3500.3.2015 VALLEY GUTTER PROFILE (FIGURE 3.6.1)**  
 (All dimensions are nominal)



**PANTEX ROOFING SYSTEMS VALLEY GUTTER PROFILE(0.4x400)**  
 (All dimensions are nominal)



**PANTEX ROOFING SYSTEMS VALLEY GUTTER PROFILE (0.55 x 450)**  
 (All dimensions are nominal)

Rev	Date	Description	By	App.
4	08.07.16	0.55x400 GIRTH VALLEY ADDED		
3	28.06.16	FURTHER REVISIONS	AjF	
2	27.06.16	AS GUTTER PROFILE REVISED	AjF	
1	23.06.16	FIRST DRAFT	AjF	

**Pantex**  
 Roofing Systems Pty Ltd

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PANTEX ROOFING SYSTEMS PL  
 ABN: 65 078 395 978

16 Magnesium Street,  
 Narangba 4504 Qld., Australia  
 (PO Box 78, Narangba 4504)

Telephone 61 7 3897 8200  
 Facsimile 61 7 3897 8222  
 Email: mail@pantexroofing.com.au

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Project	
VALLEY GUTTER COMPARISON	
Client	
PANTEX ROOFING SYSTEMS	
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EFFECTIVE CROSS SECTIONAL AREAS	
Drawing Number	Rev
1	4