DAM BUSTER®

Achieve Compliance & Conformance with

Dam Buster Products

NOTE: All Dam Buster® products are protected by various Australian and International Patents.

AUSTRALIAN OWNED #00581 CERTIFIED

QUICK DESIGN GUIDE

Version 4.2 (31 March 2024)

Refer to the Product Technical Statement for the full design information

AHSCA ASSOCIATION OF HYDRAULIC SERVICES CONSULTANTS AUSTRALIA RESEARCH FOUNDATION

CERTIFIED PRODUCT
(DAM BUSTER RAINHEAD)

For testing of the Overflow Performance of Dam Buster rectangular rainheads.

GOOD DESIGN AWARD® WINNER

PRODUCT DESIGN
HARDWARE AND BUILDING

DAM BUSTER
RAINHEAD

"The Architectural Choice"

www.dambuster.com.au

COMPLIANCE WITH THE NCC

Refer to the Dam Buster 'Evidence of Suitability' document for details of the compliance methods for the Dam Buster roof drainage system. If required, carry out the Performance Solution process, refer page 24 for a summary of this process.

DESIGN PROCESS USING DAM BUSTER BOX GUTTER DEVICES

1 - Determination of design rainfall intensity

2 - Determination of the design flow rate in L/s to each box gutter

Design of Overflow Devices

- Rainheads,
- Side Outlet & Rainhead combinations,
- Side Outlet & Sump combinations,
- Sumps,
- Continuous Sumps &
- Back-to-Back Sumps

3 - Design of box gutters discharging to a Dam Buster device

4 - Use the Dam Buster flow rate charts to select the device size and downpipe (DP) combinations

Design of Upstream devices

5(i) - Design of Elbows (including box gutters) in accordance with the specific design procedure

5(ii) - Design of Junctions (including box gutters) in accordance with the specific design procedure

1 - Determination of the design rainfall intensity = 1% AEP rainfall event ie. 100 year ARI for box gutters

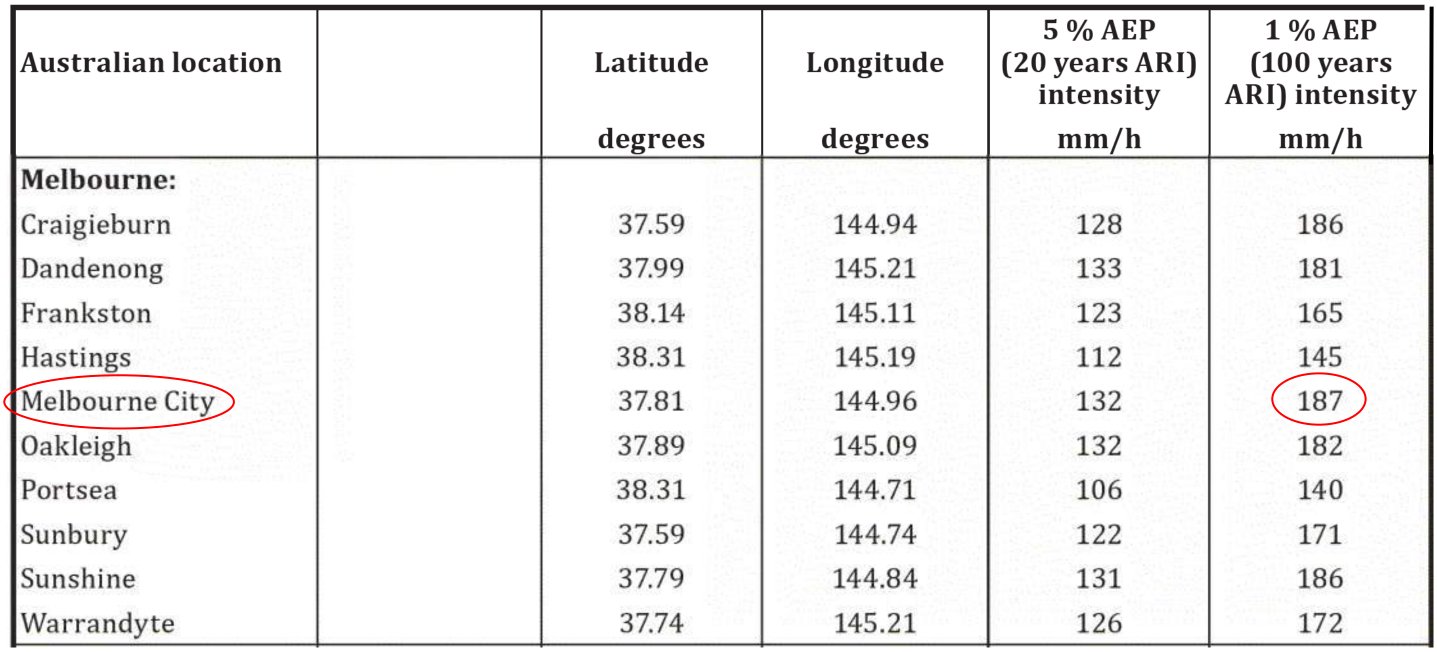
Method 1

Look up the nearest area in Table D.1, AS/NZS 3500.3-2021

NOTE - 1% AEP = 100 year ARI
ARI = Average recurrence interval
AEP= Annual exceedance probability

Example below - 1%AEP = 187 mm /h = 100I5*

*** Note -** 100 refers 100 years, I refers to Intensity, and
5 refers to 5 minutes = time of concentration
Note- the maximum 5 min consecutive rainfall
multiplied by 12 to convert to mm/hour



Australian location		Latitude degrees	Longitude degrees	5 % AEP (20 years ARI) intensity mm/h	1 % AEP (100 years ARI) intensity mm/h
Melbourne:					
Craigieburn		37.59	144.94	128	186
Dandenong		37.99	145.21	133	181
Frankston		38.14	145.11	123	165
Hastings		38.31	145.19	112	145
Melbourne City		37.81	144.96	132	187
Oakleigh		37.89	145.09	132	182
Portsea		38.31	144.71	106	140
Sunbury		37.59	144.74	122	171
Sunshine		37.79	144.84	131	186
Warrandyte		37.74	145.21	126	172

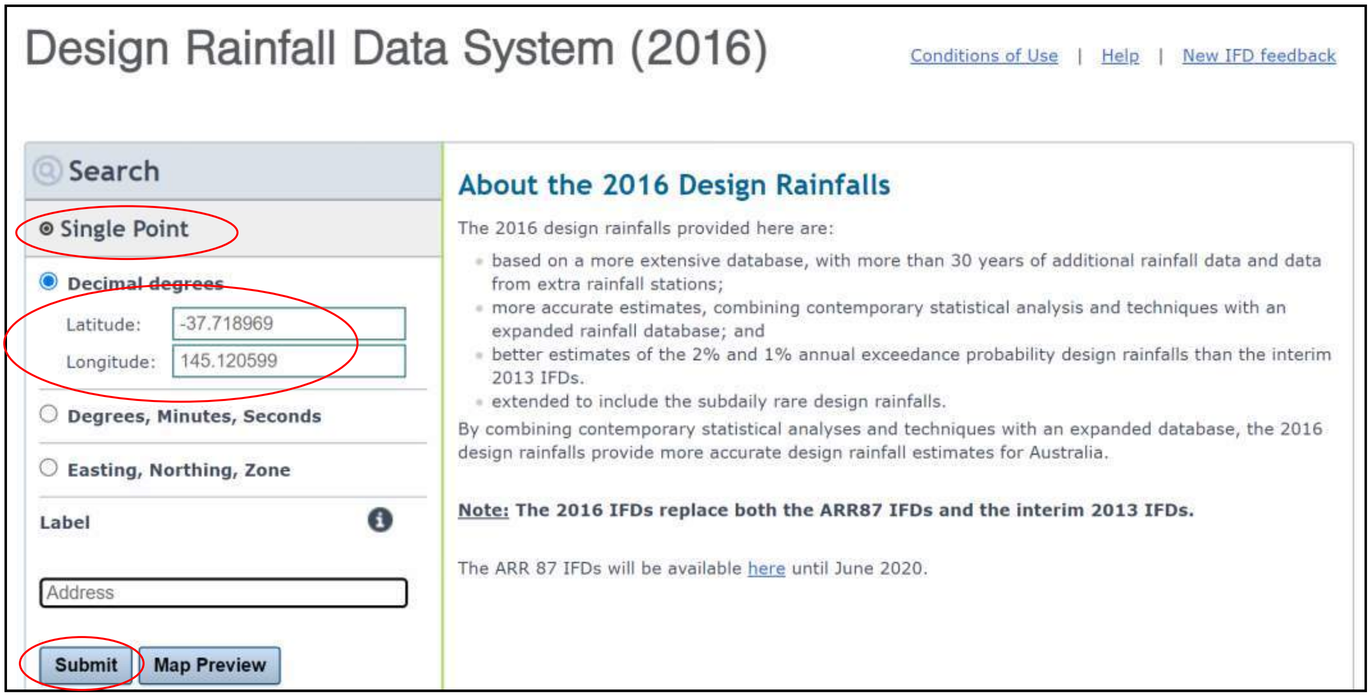
FROM TABLE D1 OF AS/NZS 3500.3-2021

Method 2

Use the BOM's IFD website - MORE ACCURATE

a) Determine the Latitude & Longitude for the site address eg
https://addressfinder.com.au/features/geocode/ **EXAMPLE LAT = -37.718969**
LONG = 145.120599

b) Use the BOM's Intensity-Frequency-Duration (IFD) website
http://www.bom.gov.au/water/designRainfalls/revised-ifd/



Design Rainfall Data System (2016)

● Single Point

● Decimal degrees

Latitude: -37.718969

Longitude: 145.120599

○ Degrees, Minutes, Seconds

○ Easting, Northing, Zone

About the 2016 Design Rainfalls

The 2016 design rainfalls provided here are:

- based on a more extensive database, with more than 30 years of additional rainfall data and data from extra rainfall stations;
- more accurate estimates, combining contemporary statistical analysis and techniques with an expanded rainfall database; and
- better estimates of the 2% and 1% annual exceedance probability design rainfalls than the interim 2013 IFDs.
- extended to include the subdaily rare design rainfalls.

By combining contemporary statistical analyses and techniques with an expanded database, the 2016 design rainfalls provide more accurate design rainfall estimates for Australia.

Note: The 2016 IFDs replace both the ARR87 IFDs and the interim 2013 IFDs.

The ARR 87 IFDs will be available here until June 2020.

Location

Label: Not provided

Latitude: -37.719 [Nearest grid cell: 37.7125 (S)]

Longitude: 145.1206 [Nearest grid cell: 145.1125 (E)]

IFD Design Rainfall Intensity (mm/h)

Issued: 29 May 2022

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
FAQ for New ARR probability terminology

Unit: mm/h

	Annual Exceedance Probability (AEP)						
Duration	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	91.3	102	142	174	210	263	311
2 min	77.1	85.6	116	141	167	207	243
3 min	69.4	77.2	105	128	152	189	222
4 min	63.5	70.9	97.4	118	141	176	207
5 min	58.8	65.8	90.9	111	133	166	195

SELECT mm/h

MONTMORENCY, VIC ADDRESS

2 - Determination of the design flow rate for each box gutter

$$\text{Design flow rate, } Q = \frac{CA \times 1\%\ AEP}{3600}$$

Q = Design flow rate in L/s

CA = Catchment area (m^2)
= Plan area + 1/2 x nett vertical area
(from worst direction)

1%AEP = Design rainfall intensity (mm/h)

(3600 = number of seconds in an hour)

Example

CA = $120m^2$
1%AEP = 195mm/h

$$Q = \frac{120 \times 195}{3600} = 6.5 \text{ L/s}$$

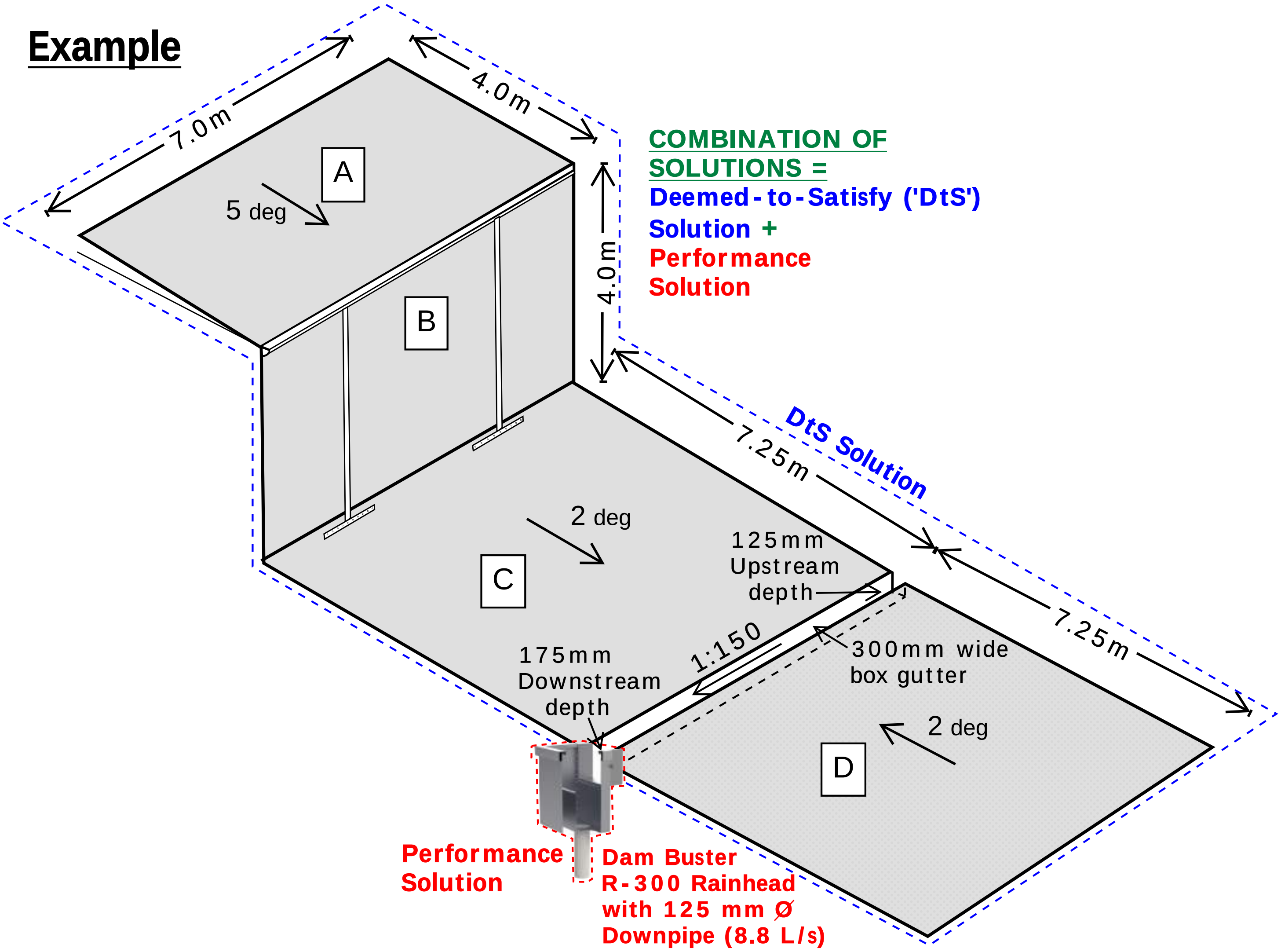
NOTE

Dam Buster adopts 3.0 L/s minimum for each box gutter i.e. if the flow rate is less than 3.0 L/s, assume 3.0L/s. This approach is in accordance with an AHSCA Research Foundation discussion paper by A/Prof Terry Lucke. HOWEVER, when designing an overflow device collecting discharge from more than one box gutter add up the actual flow rates to determine the design flow rate for the device.

Example

Dam Buster T Side Outlet and Rainhead combination
LH gutter = 1.5 L/s, RH gutter= 5.0 L/s
=> Design the rainhead & DP for 6.5 L/s (not 3.0 + 5.0 = 8.0 L/s)

Example



Catchment area = plan area + (1/2) x net vertical area

Roof A

Roof area 'A' = 7.0 x 4.0 = 28.0m2

Catchment area = 'A' x F = 28 x 1.04= **$29.1m^2$**

where F = 1 + 0.5 x tan (slope) = 1 + 0.5 x tan (5°)= 1.04

Note, F is also given in Table 3.4.3.2 of AS/NZS 3500.3-2021

Wall B

Wall area 'B' = 7.0 x 4.0 = $28.0m^2$

Catchment area = 1/2 x 28.0 = **$14.0m^2$**

Roofs C & D

Roof area = 2 x 7 x 7.25 = 101.5m2

Note, the vertical component of roofs C & D cancel each other.

Total Catchment area = 29.1 + 14.0 + 101.5 = **$144.6m^2$**

Design flow rate

Design flow rate, Q = (CA x 1% AEP) / 3600
= (144.6 x 195) / 3600
= 7.83 litres / sec

SELECTION - Dam Buster R-300 Rainhead with 125mm Diam. DP
(Allowable flow rate = 8.8 L/s > 7.83 L/s)

3 - Design of box gutters

Design Notes

1) As all box gutters discharging to Dam Buster devices are 'free flow' in both the normal and overflow conditions, all box gutters can be design in accordance with Figure H.1 of AS/NZS 3500.3-2021.

2) However, Dam Buster has tabulated Figure H1 for each of the following 4 slopes:- 1 in 200, 1 in 150, 1 in 100 & 1 in 40

3) Dam Buster adopts a minimum design flow rate of 3.0L/s

4) The design depth is the minimum UPSTREAM depth and the box gutter depth must increase towards the downstream end as follows:

1 in 200 slope => 5 mm per m

1 in 150 slope => 7mm approx. per m (actually 6.7mm per m)

1 in 100 slope => 10mm approx. per m

1 in 40 slope* = > 25mm per m

* Refer to the Product Technical Statement for the 1 in 40 design chart.

5) Whilst a slope of 1 in 200 is allowable, Dam Buster suggests a larger slope (eg 1 in 150 or 1 in 100) be adopted, particularly for:-
- Reactive clay sites, as building movement may reduce falls
- Timber framed roofs - long term creep deflections may also result in loss of fall.

NOTE
Box gutters associated with Upstream devices (Elbows and Junctions) are designed slightly differently to box gutters discharging to overflow devices. Refer pages 15 & 16 for the design procedure.

3 - Design of box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s			Example	Box gutter width (mm)					
	200	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
3.0	107	101	96	93	90	88	86	84	83
3.5	113	105	100	96	93	91	89	87	85
4.0	118	110	104	100	96	94	91	89	88
4.5	122	114	107	103	99	96	94	92	90
5.0	127	118	111	106	102	99	96	94	92
5.5	131	121	114	109	105	101	99	96	94
6.0	135	125	118	112	107	104	101	98	96
6.5	140	129	121	115	110	106	103	101	98
7.0	144	132	124	118	113	109	105	103	100
7.5	148	135	127	120	115	111	107	105	102
8.0	151	139	130	123	118	113	110	107	104
8.5	155	142	133	125	120	115	112	108	106
9.0	159	145	135	128	122	118	114	110	107
9.5	162	148	138	131	125	120	116	112	109
10.0	166	151	141	133	127	122	118	114	111
10.5	170	154	144	135	129	124	119	116	113
11.0		157	146	138	131	126	121	118	114
11.5		160	149	140	133	128	123	119	116
12.0		163	151	142	135	130	125	121	118
12.5		166	154	145	137	132	127	123	119
13.0		169	156	147	140	134	129	124	121
13.5			159	149	142	135	130	126	122
14.0			161	151	144	137	132	128	124
14.5			164	154	146	139	134	129	125
15.0			166	156	148	141	135	131	127
15.5			168	158	149	143	137	132	128
16.0				160	151	144	139	134	130

Minimum UPSTREAM box gutter depth (mm) for **1 in 200*** slope

* 1:200 slope equates to **5mm per m increasing depth** over the length of the gutter

Example
300mm wide box gutter
Flow rate = 6.0 L/s
=> Minimum UPSTREAM depth = 118mm
Recommend rounding up to nearest 5mm => Adopt 120mm UPSTEAM depth

3 - Design of box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s			Example	Box gutter width (mm)					
	200	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
3.0	104	98	94	90	88	86	84	82	81
3.5	109	102	97	94	91	88	87	85	83
4.0	113	106	101	97	94	91	89	87	86
4.5	118	110	104	100	96	94	91	89	88
5.0	122	113	107	103	99	96	94	92	90
5.5	126	117	110	105	102	98	96	94	92
6.0	130	120	113	108	104	101	98	96	94
6.5	134	124	116	111	106	103	100	98	95
7.0	138	127	119	113	109	105	102	99	97
7.5	141	130	122	116	111	107	104	101	99
8.0	145	133	125	118	113	109	106	103	101
8.5	148	136	127	121	116	111	108	105	102
9.0	152	139	130	123	118	113	110	107	104
9.5	155	142	133	125	120	115	112	108	106
10.0	158	145	135	128	122	117	113	110	107
10.5	162	148	138	130	124	119	115	112	109
11.0		150	140	132	126	121	117	113	110
11.5		153	142	134	128	123	119	115	112
12.0		156	145	136	130	125	120	117	113
12.5		158	147	139	132	126	122	118	115
13.0		161	149	141	134	128	124	120	116
13.5			152	143	136	130	125	121	118
14.0			154	145	138	132	127	123	119
14.5			156	147	139	133	128	124	121
15.0			158	149	141	135	130	126	122
15.5			161	151	143	137	132	127	123
16.0				153	145	138	133	129	125

Minimum UPSTREAM box gutter depth (mm) for **1 in 150*** slope

* 1:150 equates to **7mm approx. per m** increasing depth over the length of the gutter

Example
300mm wide box gutter
Flow rate = 6.0 L/s
=> Minimum UPSTREAM depth = 113mm
Recommend rounding up to nearest 5mm => Adopt 115mm UPSTEAM depth

3 - Design of box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s			Example	Box gutter width (mm)					
	200	250	300	350	400	450	500	550	600
3.0	102	96	92	89	86	84	83	81	80
3.5	106	100	95	92	89	87	85	83	82
4.0	110	103	98	95	92	89	87	86	84
4.5	115	107	102	98	94	92	90	88	86
5.0	119	110	105	100	97	94	92	90	88
5.5	122	114	108	103	99	96	94	92	90
6.0	126	117	110	106	102	98	96	94	92
6.5	130	120	113	108	104	101	98	96	94
7.0	133	123	116	110	106	103	100	97	95
7.5	137	126	119	113	108	105	102	99	97
8.0	140	129	121	115	110	107	103	101	98
8.5	143	132	124	117	113	109	105	102	100
9.0	147	135	126	120	115	110	107	104	102
9.5	150	137	129	122	117	112	109	106	103
10.0	153	140	131	124	119	114	110	107	105
10.5	156	143	133	126	120	116	112	109	106
11.0		145	136	128	122	118	114	110	108
11.5		148	138	130	124	119	115	112	109
12.0		150	140	132	126	121	117	113	110
12.5		153	142	134	128	123	119	115	112
13.0		155	144	136	130	124	120	116	113
13.5			147	138	131	126	122	118	115
14.0			149	140	133	128	123	119	116
14.5			151	142	135	129	125	121	117
15.0			153	144	137	131	126	122	119
15.5			155	146	138	132	128	123	120
16.0				148	140	134	129	125	121

Minimum UPSTREAM box gutter depth (mm) for **1 in 100*** slope

* 1:100 slope equates to **10mm per m** increasing depth over the length of the gutter

Example
300mm wide box gutter
Flow rate = 6.0 L/s
=> Adopt 110mm UPSTEAM depth

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s			Example	Box gutter width (mm)					
	200	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
3.0	93	88	85	83	81	79	78	77	76
3.5	96	91	88	85	83	81	80	78	77
4.0	100	94	90	87	85	83	82	80	79
4.5	103	97	93	90	87	85	83	82	81
5.0	106	100	95	92	89	87	85	83	82
5.5	109	102	97	94	91	89	87	85	84
6.0	112	105	100	96	93	90	88	86	85
6.5	115	107	102	98	95	92	90	88	86
7.0	118	110	104	100	96	94	91	89	88
7.5	120	112	106	102	98	95	93	91	89
8.0	123	114	108	103	100	97	94	92	90
8.5	126	117	110	105	101	98	96	93	92
9.0	128	119	112	107	103	100	97	95	93
9.5	131	121	114	109	105	101	98	96	94
10.0	133	123	116	110	106	103	100	97	95
10.5	136	125	118	112	108	104	101	98	96
11.0		127	119	114	109	105	102	100	97
11.5		129	121	115	111	107	104	101	99
12.0		131	123	117	112	108	105	102	100
12.5		133	125	118	113	109	106	103	101
13.0		135	126	120	115	111	107	104	102
13.5			128	122	116	112	108	105	103
14.0			130	123	118	113	110	107	104
14.5			131	125	119	115	111	108	105
15.0			133	126	120	116	112	109	106
15.5			135	127	122	117	113	110	107
16.0				129	123	118	114	111	108

Minimum UPSTREAM box gutter depth (mm) for **1 in 40*** slope

* 1:40 slope equates to **25mm per m** increasing depth over length of the gutter

Example
300mm wide box gutter
Flow rate = 6.0 L/s
=> Adopt 100mm UPSTEAM depth

4 - Selection of overflow device / DP combination

a) Rainheads

Downpipe size	Equivalent diameter	Dam Buster Rainhead size(1)				
		R-200	R-300	R-400	R-500	R-600
100 x 50	79	4.00(2)	4.00(3)		Refer note (iv)	
80 diam.	80	4.00(2)	4.00(3)			
90 diam.	90	4.70	6.50			
100 x 75	97	5.00	7.30	8.00		
100 diam.	100	5.00	7.60	8.80	8.80	
100 x 100	112		8.80	12.0	12.0	
125 diam.	125		9.50	14.2	15.4	15.9
150 x 100	137	Refer note (v)		15.8	16.0	16.0
150 diam.	150			16.0	16.0	16.0
Overflow Capacity of Device (L/s)		>16.0	>16.0	>16.0	>16.0	>16.0

(1) Curved fronted rainheads CR-www have the same capacity as rectangular rainheads
(2) Capacities determined by testing by the AHSCA Research Foundation
(3) Capacities adopted for R-200 (R-300 not tested yet for these DPs)

Maximum permissible flow rates (litres / sec)

NOTES

(i) Values in black have been determined in accordance with AS/NZS 3500.3

(ii) Values in red were determined by testing by the AHSCA Research Foundation

(iii) Values in blue were also determined by testing by the AHSCA Research Foundation. Note, AS/NZS 3500.3 permits the use of a 100x50 DP, however, no design charts are provided within the standard for this downpipe size, and consequently testing was required.

(iv) For the R-400, R-500 & R-600, smaller downpipes than noted in the table may be used, provided the maximum permissible capacity is adopted as that for the next lowest rainhead size for which a value in the table is provided, for the same DP size. For example, for a 600 Rainhead, and 90 mm diam. DP, the maximum flow rate is 6.50 L/s.

(v) These combinations are not possible

(vi) Rectangular downpipes are considered to be 98% as effective as circular downpipes. Hence the equivalent diameter is based on 0.98 times the area of the rectangular downpipe.

(vii) The capacities of **STRETCHED** rainheads are the same as for the non-stretched versions. For example, the capacity of a R-300-450 rainhead is the same as for the R-300 rainhead i.e. the stretched versions do not have additional capacity.

4 - Selection of overflow device / DP combination (cont)

b) Sumps

Normal downpipe size	Overflow Downpipe size	Sump Depth (mm)	Dam Buster Sump width (mm)				
			200	300	400	500	600
90 diam.	90 diam.	75	▨	▨	▨	▨	▨
“ “	“ “	100	3.00	▨	▨	▨	▨
“ “	“ “	125	▨	3.30	▨	▨	▨
“ “	“ “	150	3.60	▨	🟦	🟦	🟦
90 diam.	100 diam.	75	▨	3.00	▨	▨	▨
“ “	“ “	100	3.40	▨	▨	▨	▨
“ “	“ “	125	▨	4.60	▨	▨	▨
“ “	“ “	150	5.05	▨	5.05	🟦	🟦
“ “	“ “	200	▨	5.90	5.90	🟦	🟦
100 diam.	100 diam.	75	▨	3.40	▨	▨	▨
“ “	“ “	125	▨	5.70	▨	▨	▨
“ “	“ “	150	6.25	▨	6.25	6.25	6.25
“ “	“ “	200	▨	7.30	7.30	7.30	7.30
150 diam.	150 diam.	150	▨	▨	12.2	12.2	12.2
“ “	“ “	200	▨	▨	16.0	16.0	16.0

Maximum permissible flow rates (litres / sec)

Notes

1) There is one exception to values in the table above. When used in conjunction with a Side Outlet, the maximum flow rate in the 200 Dam Buster Sump should be limited to 5.0 L/s.
2) ▨ denotes sump size not currently available as a standard size, or sump size and DP combination not permitted. Refer to available standard sizes in table below.
3) 🟦 denotes sump and DP size not recommended, however, the allowable flow rates provided in the same row may be used.
4) Aerial overflow downpipes must be designed and installed at adequate grade to achieve the required flow rates. The minimum grades for critical flow rates specified in the design table (for PVC pipes) are provided in the table below for information purposes. These values have been determined from standard calculators based on the Colebrook-White equation. Note, these values apply to straight pipes with no additional bends than the bend below the sump. Where there are additional bends, obtain advice from a hydraulic engineer.

Pipe size	Flow rate	Min grade
90 diam	3.60	1 in 200
“ “ “	4.60	1 in 150
100 diam	5.50	1 in 200
“ “ “	7.30	1 in 120
150 diam	16.0	1 in 200

Refer also page 20 for an Aerial downpipe design chart.

5) **IMPORTANT** – AERIAL OVERFLOW PIPES MUST DISCHARGE VISIBLY TO ATMOSPHERE IN ORDER TO ALERT THE BUILDNG MANAGER / BUILDING OWNER / BUILDING OCCUPANT THERE IS A BLOCKAGE IN THE SYSTEM.

Dam Buster sump standard sizes

Width / Depth	200 mm	300 mm	400 mm	500 mm	600 mm
75 mm		300-75			
100 mm	200-100				
125 mm		300-125			
150 mm	200-150		400-150	500-150	600-150
200 mm		300-200	400-200	500-200	600-200

4 - Selection of overflow device / DP combination (cont)

c) Side Outlets

Apart from one exception, as noted below, no design is required for the Side Outlet itself. The Side Outlet is automatically designed when the rainhead or sump is designed. Note that Side Outlets are supplied in two interlocking, sliding components, and are adjustable to any (larger) box gutter width within the specified range for the Side Outlet. For example, a 300mm Side Outlet can be fitted to any box gutter width in the range 300mm to 450mm. Refer to the Product Technical Statement for allowable widths and limitations etc.

Exception
For the 200 Side Outlet and Sump combination (only), the flow rate must be limited to 5.0 L/s (the maximum allowable design flow rate is the lessor of the value in the Sump design table and 5.0 L/s).

5 - Selection of Upstream Devices

(i) Elbows

Elbows are designed for the total flow rate in the upstream and downstream box gutters. Refer notes below for the detailed design procedure.

Device Size	Maximum Flow Rate (L/s)	Contraction Range for Upstream Gutter	Maximum box gutter depth at Entry (mm)	Drop within Elbow (mm)	Maximum box gutter depth at Exit (mm)
ELB-200	5.0	200	180	50	230
ELB-300	9.5	300 -> 200	215	60	265
ELB-400	16.0	400 -> 300	230	70	300
ELB-500	16.0	500 -> 300	230	70	300
ELB-600	16.0	600 -> 400	230	70	300

NOTES

1. The maximum box gutter depth at Entry to the device is the maximum allowable downstream depth of the upstream box gutter.
2. The Elbow is trimmed to match the designed downstream depth of the upstream box gutter. Refer to the Installation Manual.
3. The upstream box gutter is designed (in accordance with figure H.1 of AS/NZS 3500.3) for a flow rate equivalent to the total catchment area of the upstream and downstream box gutters. It is not necessary to design the downstream box gutter.
4. All Elbows are supplied as ‘Sliding’ Elbows (i.e. supplied in two-piece / adjustable) by default. Sliding Elbows are able to contract for the upstream box gutter width within the specified range (all sizes except 200)
5. ‘Fixed’ Elbows are also for special larger volume orders (over 20 units), however fixed Elbows are not adjustable for the upstream box gutter.
6. **ONLY THE UPSTREAM BOX GUTTER MAY BE CONTRACTED. THE DOWNSTREAM BOX GUTTER MAY NOT BE NARROWER THAN THE UPSTREAM BOX GUTTER.**

5 - Selection the Upstream Devices (cont.)

(ii) Junctions

Junctions are also designed for the total flow in the upstream and downstream box gutters. Refer notes below for the detailed design procedure.

Device Size	Maximum Design Flow Rate (L/s)	Contraction Range for Upstream Gutter	Maximum box gutter depth at Entry (mm)	Drop within Junction (mm)	Maximum box gutter depth at Exit (mm)
JUN-200	5.0	200	180	50	230
JUN-300	9.5	300 -> 200	215	60	265
JUN-400	16.0	400 -> 300	230	70	300

NOTES

1. The maximum box gutter depth at Entry to the device is the maximum allowable downstream depth of the 'critical upstream box gutter' (refer note 3).
2. The Junction is trimmed to match the design downstream depth of the 'critical upstream box gutter'. Refer to the Installation Manual.
3. The upstream box gutter with the larger catchment area (the 'critical upstream box gutter') only is designed, and the opposite upstream box gutter ('non-critical box gutter') is sized to match the 'critical box gutter'. It is not necessary to design the downstream box gutter.
4. The 'critical box gutter' is designed (in accordance with figure H.1 of AS/NZS 3500.3) for the the catchment area to this gutter, plus any additional catchment area flowing directly into the downstream box gutter.
5. The total flow rate in all gutters must not exceed the Maximum Design Flow rate in the table.
6. All Junctions are supplied as 'Sliding' Junctions (i.e. supplied in two-piece / adjustable) by default. Sliding Junctions are able to contract for the upstream box gutter width within the specified range (all sizes except 200)
7. 'Fixed' Junctions are also for special larger volume orders (over 20 units), however fixed Junctions are not adjustable for the upstream box gutter.
8. **ONLY THE UPSTREAM BOX GUTTERS MAY BE CONTRACTED. THE DOWNSTREAM BOX GUTTER MAY NOT BE NARROWER THAN THE UPSTREAMS BOX GUTTER.**

Design strategy for volume builder homes

Rainfall Category ‘RC’	1%AEP Box gutters	5% AEP Eaves gutters	Box gutter factor, Kb	Eaves gutter factor, Ke
RC1	200mm /h	150mm /h	18	24
RC2	250mm /h	185 mm/h	14.4	19.5
RC3	300mm /h	225mm/h	12	16
RC4	350mm /h	260mm/h	10.3	13.8

NOTES

1. The 5% AEP is assumed to be 75% of the 1%AEP. This will cover most cases; however, this should be confirmed for each new suburb.
2. Refer to page 17 for an explanation of the Kb & Ke factors.
3. For homes with relatively small catchment areas, selection of the highest category for all proposed home locations (suburbs) may result in one roof drainage design only. For larger roof catchment areas, roof drainage designs for two rainfall categories only would typically be adequate, depending on the range of suburbs / locations proposed for that house.

Step A – Determine the rainfall intensity category for the property

- Determine the Rainfall Category for the suburb the house is being constructed in. This information would be determined once for each suburb using Methods 1 and / or 2 (see pages 4 and 5 for Methods 1 and 2).

Step B – Design the box gutters

- Determine the catchment area, ‘CA’, for each box gutter under consideration.
- Calculate the design flow rate ‘Q’, in L/s= CA / Kb, for example:
    - RC3, CA= 120m^2 => Q= 120/12 = 10 L/s
- Use the Dam Buster box gutter design charts to determine the minimum upstream depth for the selected fall for example:
    - 300mm wide box gutter, Q= 10 L/s, 1 in 150=> Upstream depth = 135mm
- Calculate the required downstream depth using the selected fall of the box gutter.
- Note - where there are 2 or more inlet box gutters, increase box gutter depths as required to that they are the same at their downstream ends i.e., at the entry to the overflow device

Step C – Design the box gutter overflow devices & upstream devices

- For box gutter overflow devices, select the overflow device and DP combination based on the total flow rate for from all ‘inlet’ box gutters
    - For Rainheads, and Side Outlet & Rainhead combinations
        - Use the Rainhead Design Table to select the device and DP combination
    - For Sumps
        - Use the Sump Design Table to select the device and DP combination
- For Upstream devices
    - Elbows
        - Use the box gutter design charts to select the upstream depth of the inlet box gutter, based on the total flow rate to the inlet and outlet gutters
    - Junctions
        - Use the box gutter design charts to select the upstream depth of the larger inlet box gutter, based on the total flow rate to the larger inlet box gutter, plus the outlet box gutter
        - Determine the downstream depth of the larger inlet box gutter using the fall
        - Set the downstream depth of the smaller inlet box gutter to be equal to the downstream depth of the larger box gutter

Design strategy for volume builder homes (cont.)

Explanation of Kb and Ke factors

In the design flow rate, ‘Q’, is calculated as follows (refer also Step 2, pages 6 and 7):

$$Q = \frac{\text{Catchment area (‘CA’) x AEP}}{3600}$$

, where-

Q = Flow rate in L/s

CA= Catchment are in m^2

AEP = Design rainfall intensity in mm/h

If 1 mm of rain falls on 1 m^2 of roof, that equates to 1 Litre of rainfall.

However, the rainfall intensity is provided in mm/h i.e. mm/3600 seconds. Hence, if we calculate the flow rate based on the AEP, we would get a result in mm/h. So we need to divide by 3600 to convert from mm/hour to mm/second.

The equate above can be re-written as:

$$Q = \frac{\text{Catchment area (‘CA’)}}{(3600 / \text{AEP})}$$

To simply this, the equation can be rewritten as-

$Q = \frac{CA}{K}$ where K= 3600/AEP

However, the values of k are different for box gutters (which are designed based on the 1% AEP) and eaves gutters (which are designed based on the 5% AEP).

Hence the K factors for box gutter and eaves gutters are determined as follows:

Box Gutters
Kb = 3600 / 1% AEP

Eaves Gutters
Ke = 3600 / 5% AEP

Refer to AS/NZS 3500.3-2021 for the design method for eaves gutters.

Design chart for aerial downpipes

Slope	Pipe diameter			
	90mm	**100mm**	**150mm**	**225mm**
1 in 200	4.14	5.49	16.2	47.5
1 in 190	4.26	5.65	16.6	48.9
1 in 180	4.39	5.82	17.1	50.3
1 in 170	4.53	6.00	17.7	51.9
1 in 160	4.68	6.21	18.3	53.7
1 in 150	4.85	6.43	18.9	55.6
1 in 140	5.04	6.68	19.6	57.7
1 in 130	5.25	6.96	20.5	60.1
1 in 120	5.49	7.27	21.4	62.7
1 in 110	5.76	7.63	22.4	65.7
1 in 100	6.07	8.04	23.6	69.2
1 in 90	6.43	8.52	25.0	73.3
1 in 80	6.86	9.09	26.7	78.0
1 in 70	7.38	9.77	28.7	83.9
1 in 60	8.03	10.6	31.2	91.1
1 in 50	8.87	11.7	34.4	100.4

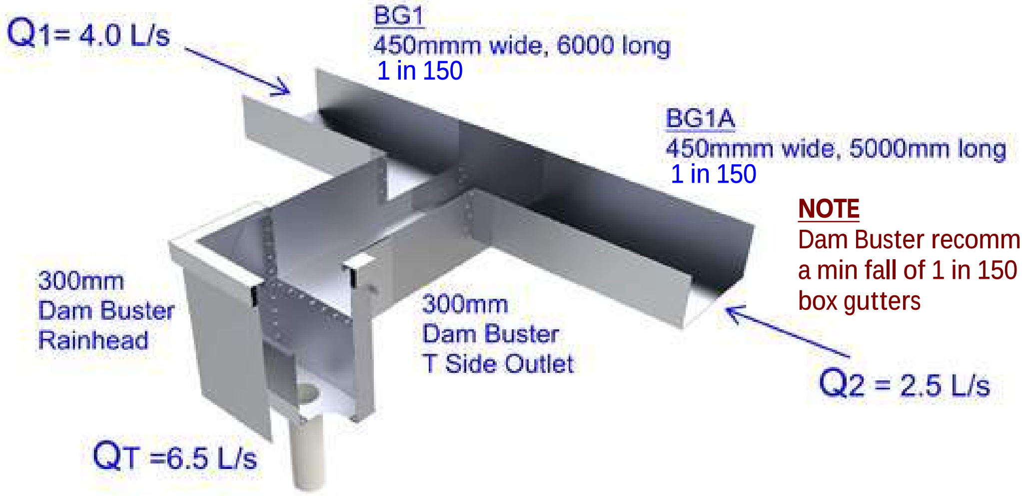
Maximum flow rates* (L/s)

* Based on a standard Colebrook-White calculator

Note

The table assumes there are no additional bends in the aerial downpipe other than the bend below the sump. Where there are additional bends, which will result in energy losses, advice should be obtained from a hydraulic engineer.

Design example - Tee Side Outlet and Rainhead combination



NOTE
Dam Buster recommends a min fall of 1 in 150 for box gutters

1 - Design the box gutters

From design charts, minimum upstream depths
BG1 - 91mm, adopt 95mm
BG2 - 86mm. adopt 90mm

Minimum downstream depths
BG1 = 95 + 6000/150= 95 + 40 = 135
BG2 = 90 + 5000/150= 90 + 35 = 125

Adopt
BG1 - (100mm to 140mm) Deep x 450mm wide
BG2 - " " " "

Note - 140mm is the standard height of a 300mm Side Outlet

2 - Select the overflow device and DP

The only design required is for the rainhead, as the Side Outlet is automatically designed

Adopt
Dam Buster TSO-300 Tee Side Outlet & R-300 Rainhead combination with 90mm Diam. DP

Note
All box gutters are designed for a minimum flow rate, Qmin =3 L/s

Downpipe size	Equivalent diameter	Dam Buster Rainhead size$^{(1)}$				
		R-200	R-300	R-400	R-500	R-600
100 x 50	79	$4.00^{(2)}$	$4.00^{(3)}$		Refer note (iv)	
80 diam.	80	$4.00^{(2)}$	$4.00^{(3)}$			
90 diam.	90	4.70	6.50			
100 x 75	97	5.00	7.30	8.00		
100 diam.	100	5.00	7.60	8.80	8.80	
100 x 100	112		8.80	12.0	12.0	
125 diam.	125		9.50	14.2	15.4	15.9
150 x 100	137	Refer note (v)		15.8	16.0	16.0
150 diam.	150			16.0	16.0	16.0
Overflow Capacity of Device (L/s)		>16.0	>16.0	>16.0	>16.0	>16.0

(1) Curved fronted rainheads CR-www have the same capacity as rectangular rainheads
(2) Capacities determined by testing by the AHSCA Research Foundation
(3) Capacities adopted for R-200 (R-300 not tested yet for these DPs)

Maximum permissible flow rates (litres / sec)

Design example - Free Flow Sump

1 - Design the box gutter

From design charts, minimum upstream depth:
BG1 - 106mm say 110mm

Downstream depth
BG1 = 110 + 8000/150= 110 + 55= 165mm say 170mm
Adopt
BG1 - (110mm to 170mm) deep x 400mm wide

2 - Select the overflow device and DP

Adopt
Dam Buster SU-400-200 Sump with
100mm Primary DP &
100mm Aerial Overflow DP, 1 in 140* min
* Refer design chart for aerial overflow pipes, page 19

Normal downpipe size	Overflow Downpipe size	Sump Depth (mm)	Dam Buster Sump width (mm)				
			200	300	400	500	600
90 diam.	90 diam.	100	3.00				
“ “	“ “	125					
“ “	“ “	150	3.60			Refer Note 4	
90 diam.	100 diam.	100	3.40				
“ “	“ “	125		4.60			
“ “	“ “	150	5.05		5.05		
“ “	“ “	200		5.90	5.90		
100 diam.	100 diam.	75		3.40			
“ “	“ “	125		5.70			
“ “	“ “	150	6.25		6.25	6.25	6.25
“ “	“ “	200		7.30	7.30	7.30	7.30
150 diam.	150 diam.	150	Refer Note 5		12.2	12.2	12.2
“ “	“ “	200			16.0	16.0	16.0

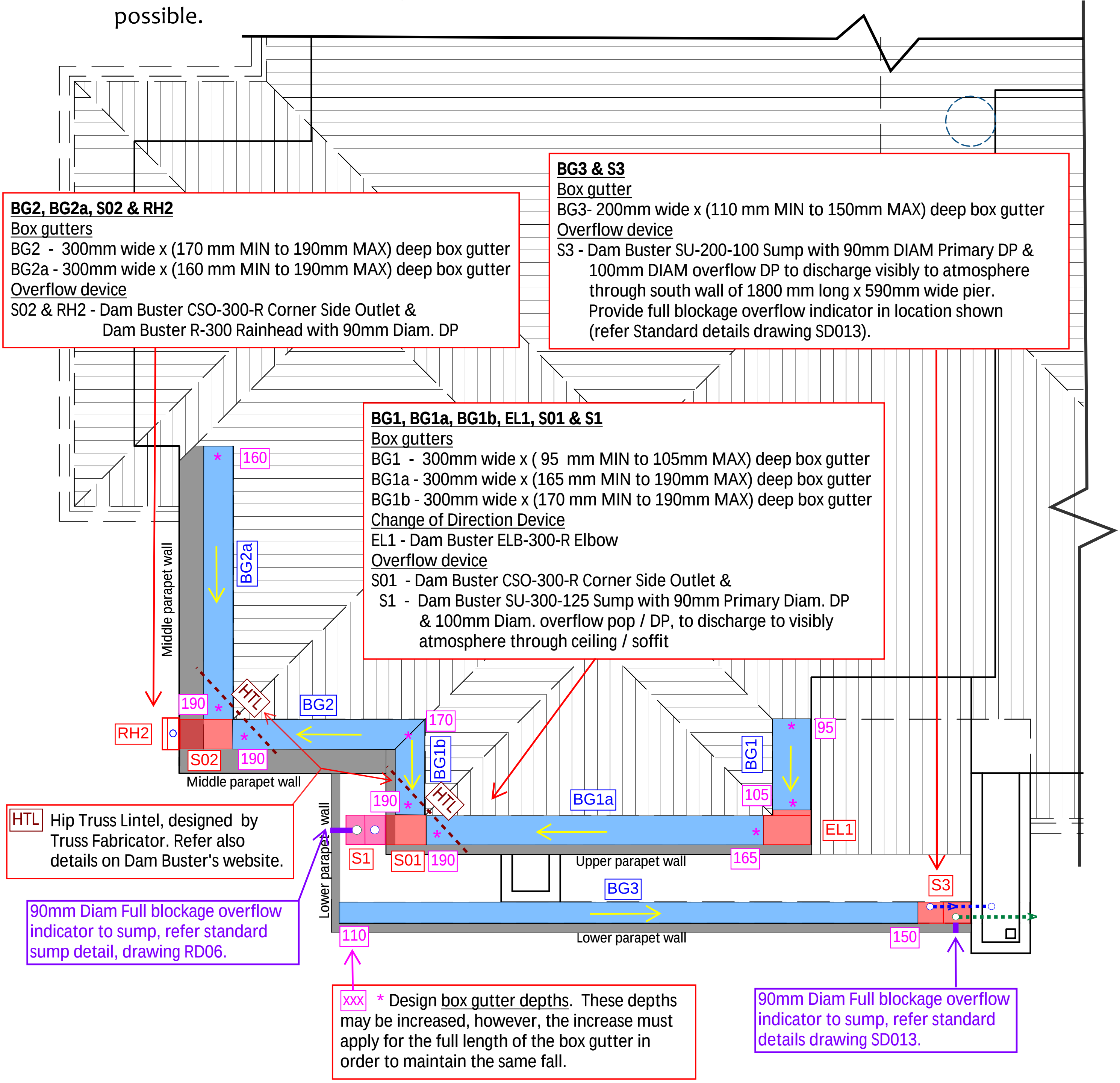
Maximum permissible flow rates (litres / sec)

Dam Buster sump standard sizes

Width Depth	200 mm	300 mm	400 mm	500 mm	600 mm
75 mm		300-75			
100 mm	200-100				
125 mm		300-125			
150 mm	200-150		400-150	500-150	600-150
200 mm		300-200	400-200	500-200	600-200

Design example including upstream devices

The example below includes one 'upstream' device, a Dam Buster Elbow. Careful coordination is required between all box gutter depths. In this case, the maximum box gutter depth was determined by commencing at the upstream end of BG1 and then working towards the downstream end BG1a.The upstream depth of BG1b was then set by working upstream after matching the downstream depth of BG1b with the downstream depth of BG1a. Then the downstream depth of BG2 was calculated and finally upstream depth BG2a was determined. Designs are unlikely to be more complicated than this one and it should be noted that determining a compliant solution using the DtS devices in AS/NZS 3500.3, whilst fitting within the architectural constraints, would not have been possible.



BG3 & S3
Box gutter
BG3- 200mm wide x (110 mm MIN to 150mm MAX) deep box gutter
Overflow device
S3 - Dam Buster SU-200-100 Sump with 90mm DIAM Primary DP & 100mm DIAM overflow DP to discharge visibly to atmosphere through south wall of 1800 mm long x 590mm wide pier. Provide full blockage overflow indicator in location shown (refer Standard details drawing SD013).

BG2, BG2a, S02 & RH2
Box gutters
BG2 - 300mm wide x (170 mm MIN to 190mm MAX) deep box gutter
BG2a - 300mm wide x (160 mm MIN to 190mm MAX) deep box gutter
Overflow device
S02 & RH2 - Dam Buster CSO-300-R Corner Side Outlet & Dam Buster R-300 Rainhead with 90mm Diam. DP

BG1, BG1a, BG1b, EL1, S01 & S1
Box gutters
BG1 - 300mm wide x (95 mm MIN to 105mm MAX) deep box gutter
BG1a - 300mm wide x (165 mm MIN to 190mm MAX) deep box gutter
BG1b - 300mm wide x (170 mm MIN to 190mm MAX) deep box gutter
Change of Direction Device
EL1 - Dam Buster ELB-300-R Elbow
Overflow device
S01 - Dam Buster CSO-300-R Corner Side Outlet &
S1 - Dam Buster SU-300-125 Sump with 90mm Primary Diam. DP & 100mm Diam. overflow pop / DP, to discharge to visibly atmosphere through ceiling / soffit

HTL Hip Truss Lintel, designed by Truss Fabricator. Refer also details on Dam Buster's website.

90mm Diam Full blockage overflow indicator to sump, refer standard sump detail, drawing RD06.

xxx * Design box gutter depths. These depths may be increased, however, the increase must apply for the full length of the box gutter in order to maintain the same fall.

90mm Diam Full blockage overflow indicator to sump, refer standard details drawing SD013.

Part Roof plan

Dam Buster Product Names

Label	Name	Sizes				
Rainheads						
R-www	Rainhead	R-200	R-300	R-400	R-500	R-600
CR-www	Curved Rainhead	CR-200	CR-300	CR-400	CR-500	CR-600
R-www-F	Flat Back Rainhead	R-200-F	R-300-F	R-400-F	R-500-F	R-600-F
CR-www-F	Flat Back Curved Rainhead	CR-200-F	CR-300-F	CR-400-F	CR-500-F	CR-600-F
Stretched Rainheads						
R-200-www	Stretched R-200 Rainhead (1)	R-200-300				
R-200-www-F	Stretched FB R-200 Rainhead (1)	R-200-300-F				
R-300-www	Stretched R-300 Rainhead (1)	R-300-350	R-300-380	R-300-400	R-300-450	R-300-500
R-300-www-F	Stretched FB R-300 Rainhead (1)	R-300-350-F	R-300-380-F	R-300-400-F	R-300-450-F	R-300-500-F
Sumps						
SU-www-ddd	Sump	200	300	400	500	600
	75		SU-300-75			
	100	SU-200-100				
	125		SU-300-125			
	150	SU-200-150		SU-400-150	SU-500-150	SU-600-150
	200		SU-300-200	SU-400-200	SU-500-200	SU-600-200
Side Outlets						
TSO-www	T Side Outlet	TSO-200	TSO-300	TSO-400	n/a	n/a
ESO-www-L	End Side Outlet, LH	ESO-200-L	ESO-300-L	ESO-400-L	n/a	n/a
ESO-www-R	End Side Outlet, RH	ESO-200-R	ESO-300-R	ESO-400-R	n/a	n/a
CSO-www-L	Corner Side Outlet, LH	CSO-200-L	CSO-300-L	CSO-400-L	n/a	n/a
CSO-www-R	Corner Side Outlet, RH	CSO-200-R	CSO-300-R	CSO-400-R	n/a	n/a
XSO-www	Cruciform Side Outlet	XSO-200	XSO-300	XSO-400	n/a	n/a
Elbows						
ELB-www-L	Elbow, LH	ELB-200-L	ELB-300-L	ELB-400-L	ELB-500-L	ELB-600-L
ELB-www-R	Elbow, RH	ELB-200-R	ELB-300-R	ELB-400-R	ELB-500-R	ELB-600-R
Junctions						
TJN-www	Tee Junction	TJN-200	TJN-300	TJN-400	n/a	n/a
CJN-www-L	Corner Junction, LH	CJN-200-L	CJN-300-L	CJN-400-L	n/a	n/a
CJN-www-R	Corner Junction, RH	CJN-200-R	CJN-300-R	CJN-400-R	n/a	n/a
Ancillary Products						
BGA-www-WWW	Box Gutter Adaptor	BGA-200-300				
			BGA-300-500			
				BGA-400-600		
CL-www	Chute Lid	CL-200	CL-300	CL-400	CL-500	CL-600
SC-www	Sump cover	SC-200	SC-300	SC-400	SC-500	SC-600

NOTES

1. The R-300 is also available in a number of (non-standard) widths between up to 500mm wide, in a 'stretched' form such that the width of the rainhead (and box gutter receiver) in increased, but all other dimensions remained the same. The 'stretched' rainheads currently available are R-300-**350**, R-300-**380**, R-300-**400**, R-300-**450** & R-300-**500**. Refer also to the Product Data Sheets. Other 'non-standard' sizes may become available in the future, however Custom rainhead sizes are also available, contact Dam Buster for further information. The R-200 is available as one stretched width, R-200-**300.**
2. All Side Outlets and Elbows are supplied as 'Sliding' (i.e. two-piece / adjustable). However, these products can also be supplied as 'Fixed' (i.e. one-piece) for special larger volume orders (over 20 units).

PERFORMANCE SOLUTION PROCESS & DOCUMENTATION

Required when the Regulatory Authority or Building Surveyor / Building Certifier does not accept Dam Buster products as being Deemed-to-Satisfy by Expert Judgement.

STEP A - Fill out the job details for the PBDB (Performance Based Design Brief) and have all 'key stakeholders' sign it.

Note - Refer to the Dam Buster website for a PBDB template.

STEP B - Document the proposed solution

STEP C - Prepare the Final Report and attach the signed PBDB.

Note - there is a Final Report template on the Dam Buster website for each of the following (which have similar, but different, Performance Requirements):-

- **BCA Vol 1**
- **BCA Vol 2**
- **PCA (VIC)**
- **PCA (TAS)**

The documentation (drawings / sketches and computations) must be attached to the Final report.

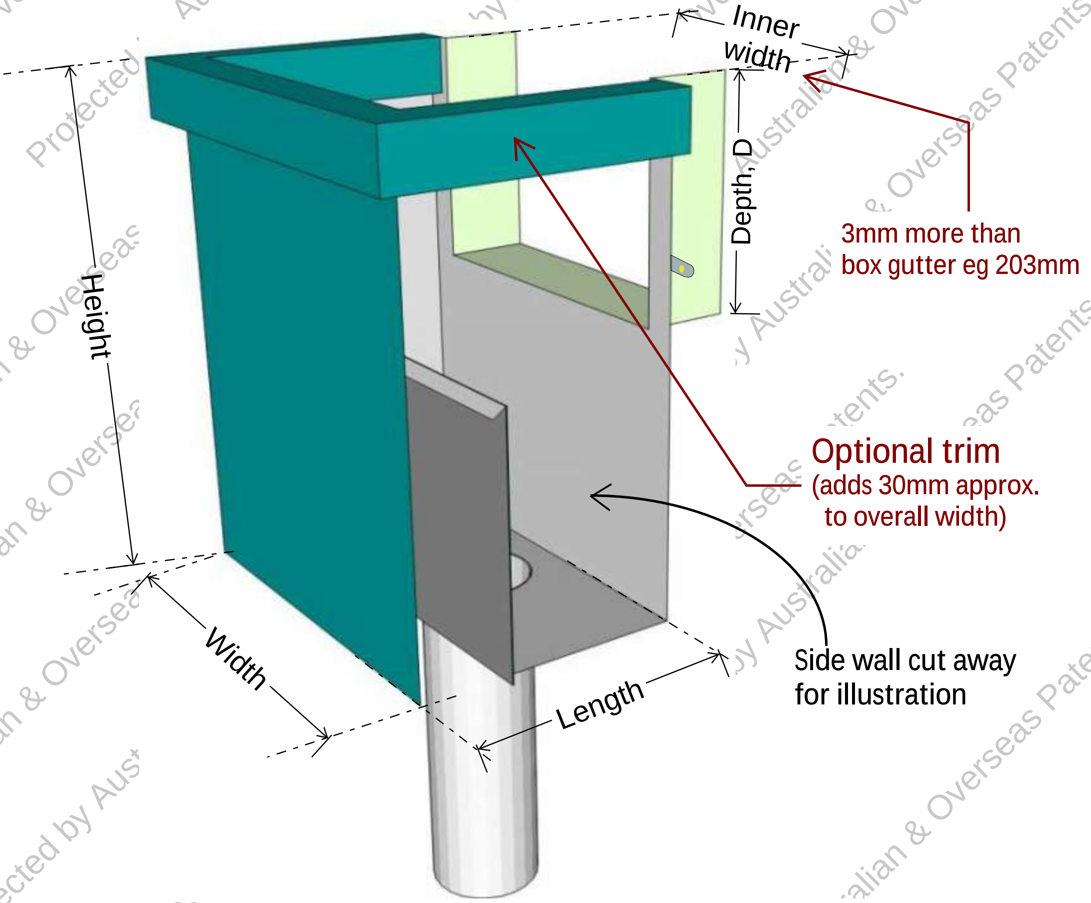
DAM BUSTER®

Product Data Sheet Rainhead R-www & R-www-F

AUSTRALIAN OWNED #00581 CERTIFIED

Standard sizes to suit 200mm, 300mm, 400mm, 500mm and 600mm wide box gutters. Refer to the table below for available Non-Standard sizes.

-F refers to the Flat Back version of the rainhead (i.e no box gutter receiver)



STANDARD RAINHEAD DIMENSIONS – R series

Rainhead size	Width (mm)	Height (mm)	Length (mm)	Box gutter Width (mm)	Box g. receiver Depth 'D' (mm)
R-200	265	350	205	200	200
R-300	365	450	245	300	200
R-400	465	600	325	400	250
R-500	565	650	325	500	275
R-600	665	700	325	600	300

NON-STANDARD RAINHEAD DIMENSIONS for R-200-xxx & R-300-xxx series

Rainhead size	Width (mm)	Height (mm)	Length (mm)	Box gutter Width (mm)	Box g. receiver Depth 'D' (mm)
R-**200**-300	365	350	205	300	200
R-**300**-350	415	450	245	350	200
R-**300**-380	445	450	245	380	200
R-**300**-400	465	450	245	400	200
R-**300**-450	515	450	245	450	200
R-**300**-500	565	450	245	500	200

CERTIFIED PRODUCT
(DAM BUSTER RAINHEAD OVERFLOW PERFORMANCE)

GOOD DESIGN AWARD® WINNER

HARDWARE AND BUILDING PRODUCT DESIGN

DAM BUSTER RAIN HEAD

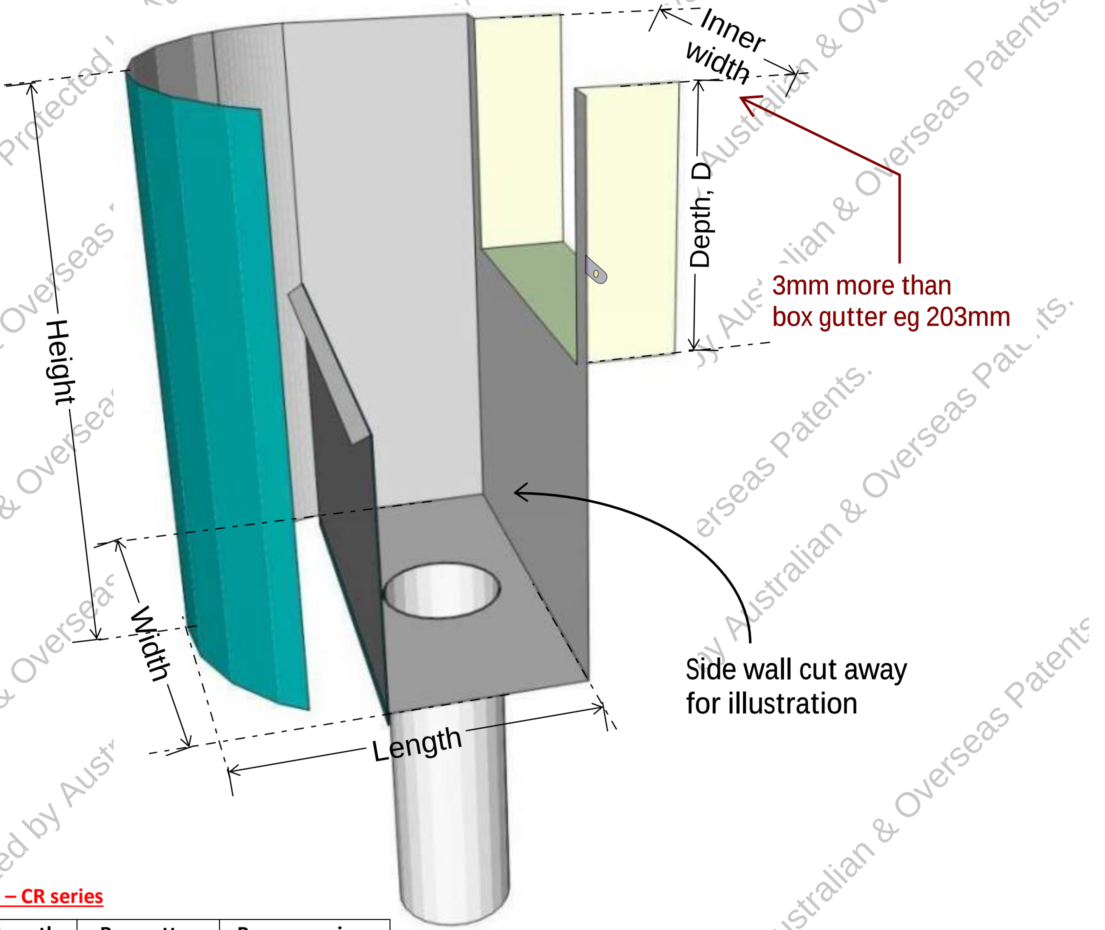
DAM BUSTER®

Product Data Sheet
Curved Rainhead CR-www & CR-www-F

AUSTRALIAN OWNED #00581 CERTIFIED

Standard sizes to suit 200mm, 300mm, 400mm 500mm & 600mm wide box gutters.

-F refers to the Flat Back version of the rainhead (i.e no box gutter receiver)



3mm more than box gutter eg 203mm

Side wall cut away for illustration

CURVED RAINHEAD DIMENSIONS – CR series

Rainhead size	Width (mm)	Height (mm)	Length (mm)	Box gutter Width (mm)	Box g. receiver Depth 'D' (mm)
CR-200	265	350	240	200	200
CR-300	365	450	290	300	200
CR-400	465	600	375	400	250
CR-500	565	650	375	500	275
CR-600	665	700	375	600	300

AHSCA ASSOCIATION OF HYDRAULIC SERVICES CONSULTANTS AUSTRALIA RESEARCH FOUNDATION

CERTIFIED PRODUCT
(DAM BUSTER RAINHEAD)

GOOD DESIGN AWARD® WINNER

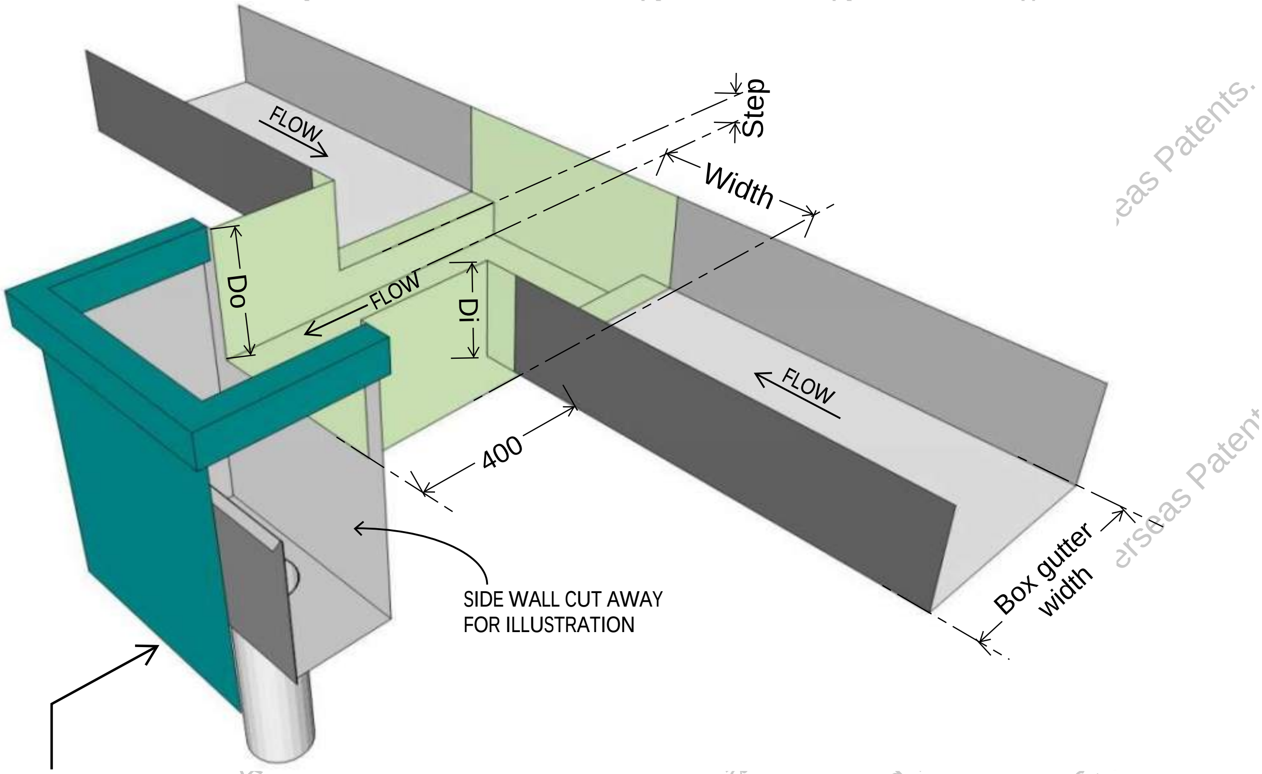
PRODUCT DESIGN
HARDWARE AND BUILDING

DAM BUSTER
RAIN HEAD

Product Data Sheet

'T' Side Outlets TSO-www

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



Refer to Rainhead
PDS for details

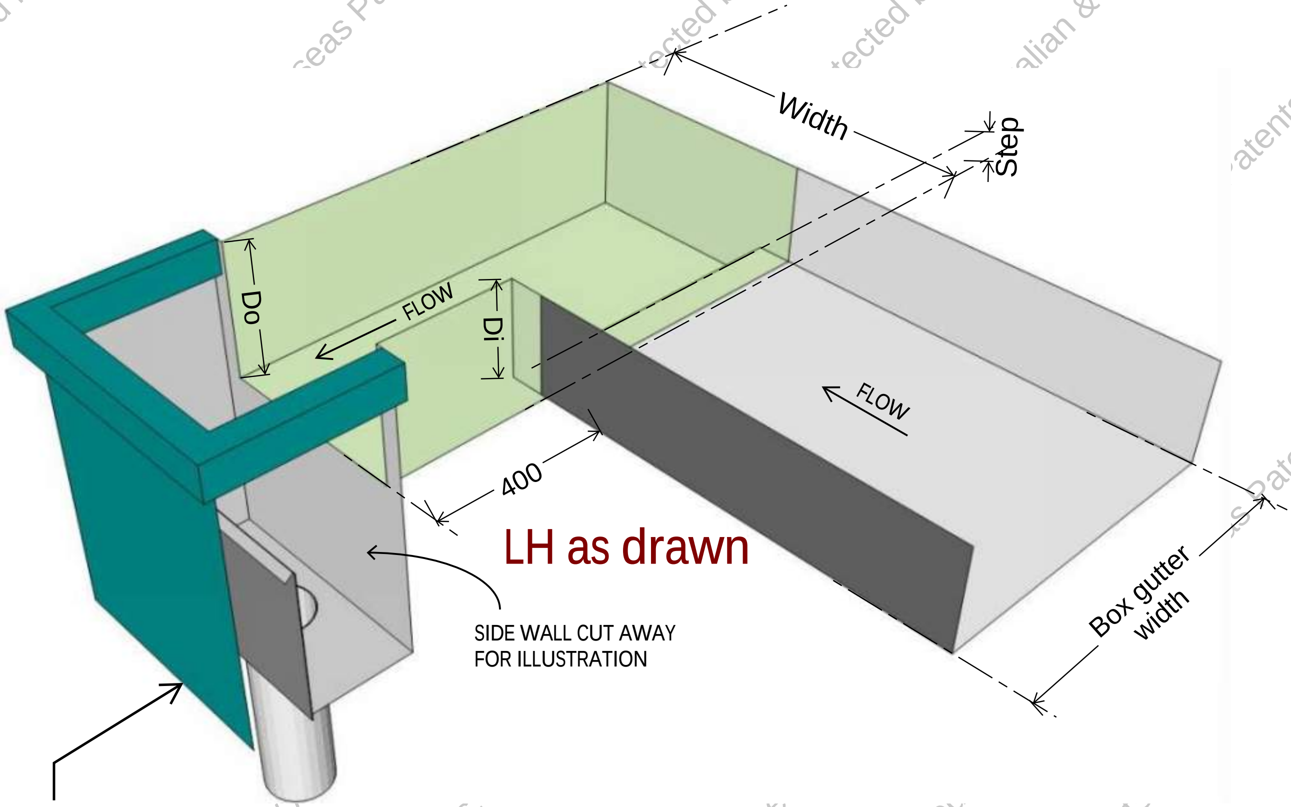
NOTE - The T Side Outlet may also be used in combination with a
Dam Buster Sump - refer to the Standard Details drawings

'T' Side Outlet dimensions

Side Outlet size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter width range (mm)
TSO-200	R-200 or CR-200	200	50	150	200	200 to 350
TSO-300	R-300 or CR-300	300	60	140	200	300 to 450
TSO-400	R-400 or CR-400	400	70	180	250	400 to 600

Product Data Sheet
'End' Side Outlets ESO-www-L

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



Refer to Rainhead
PDS for details

NOTE - The End Side Outlet may also be used in combination with a Dam Buster Sump - refer to the Standard Details drawings

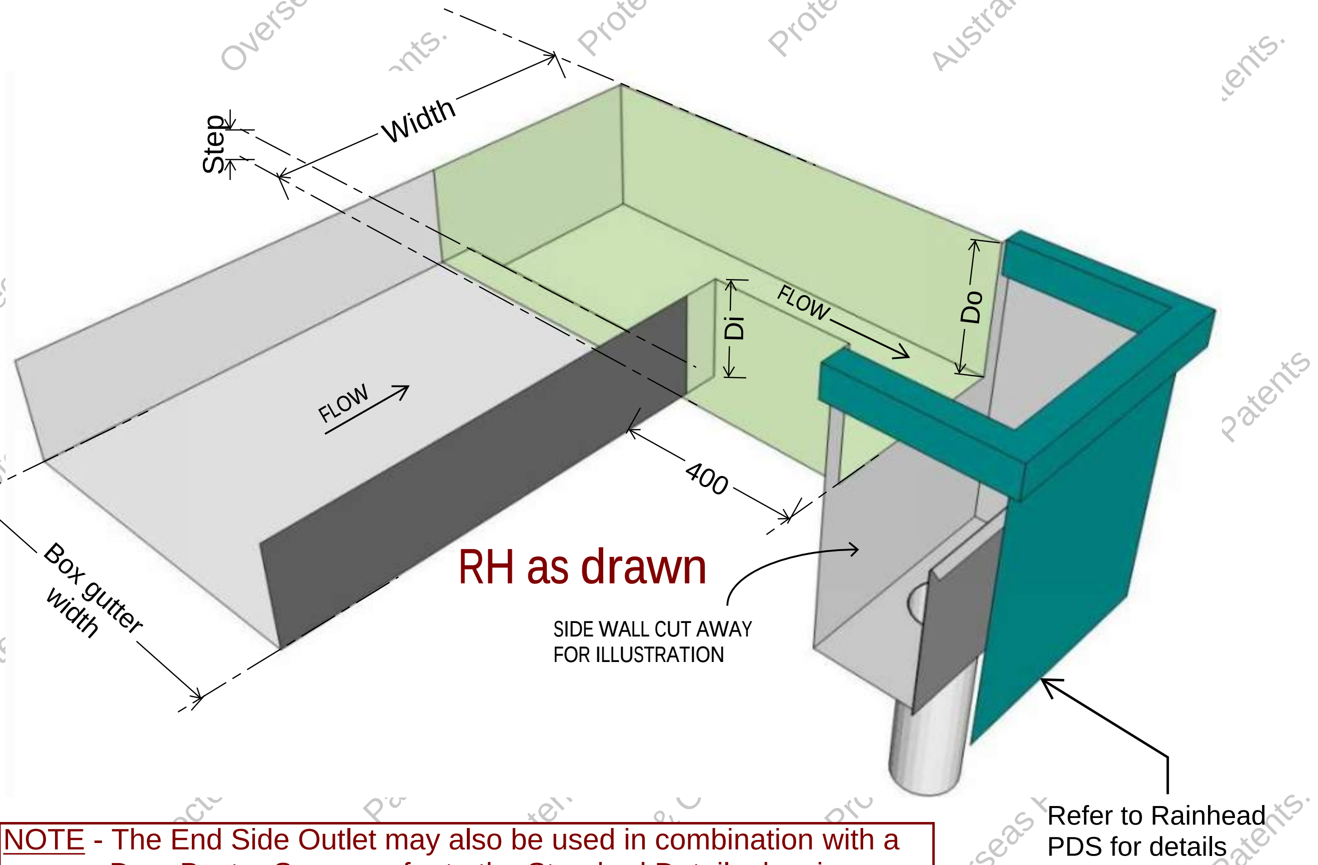
'End' Side Outlet dimensions

Side Outlet size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter width range (mm)
ESO-200-L	R-200 or CR-200	200	50	150	200	200 to 350
ESO-300-L	R-300 or CR-300	300	60	140	200	300 to 450
ESO-400-L	R-400 or CR-400	400	70	180	250	400 to 600

Product Data Sheet

'End' Side Outlets ESO-www-R

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



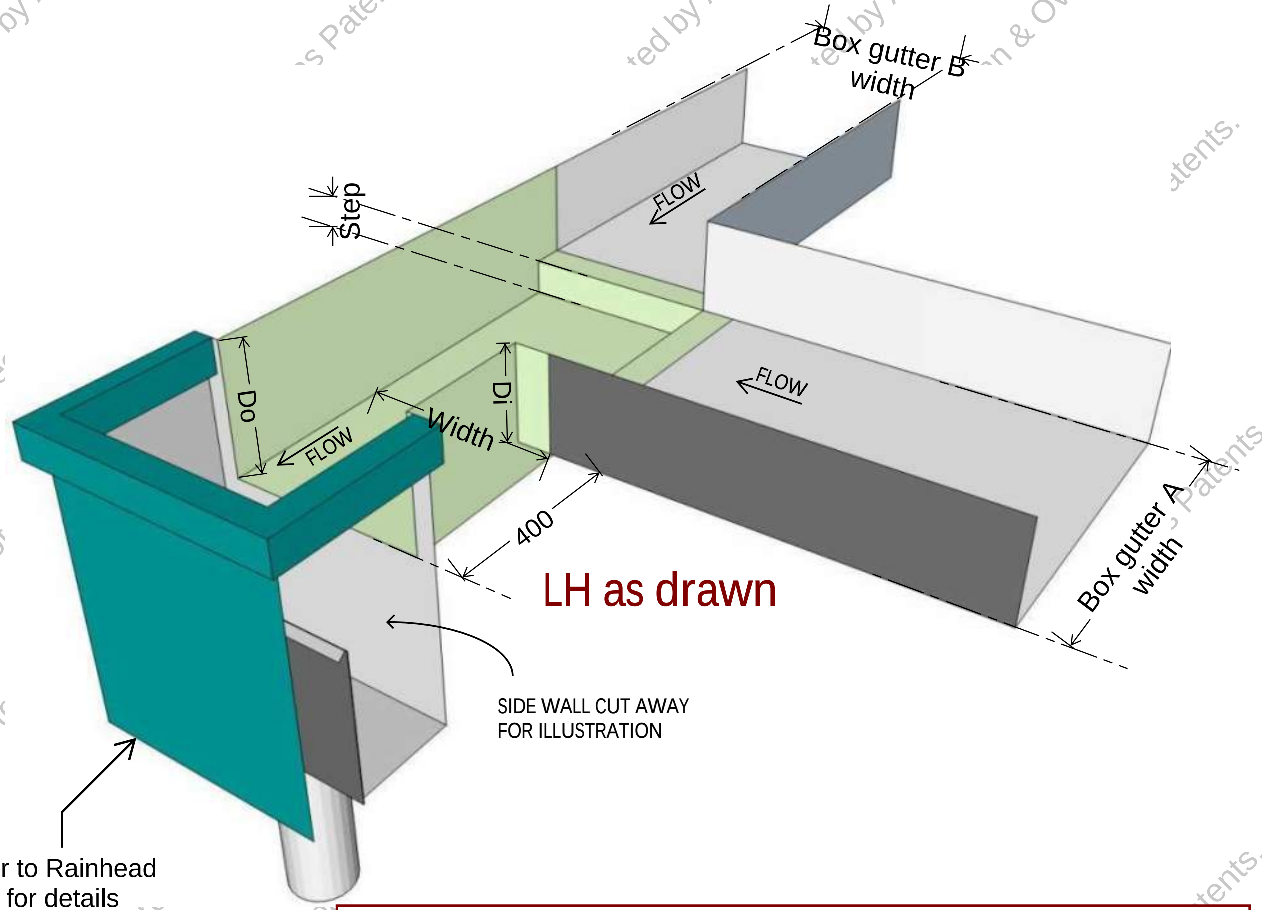
NOTE - The End Side Outlet may also be used in combination with a Dam Buster Sump - refer to the Standard Details drawings

'End' Side Outlet dimensions

Side Outlet size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter width range (mm)
ESO-200- R	R-200 or CR-200	200	50	150	200	200 to 350
ESO-300- R	R-300 or CR-300	300	60	140	200	300 to 450
ESO-400- R	R-400 or CR-400	400	70	180	250	400 to 600

Product Data Sheet
'Corner' Side Outlets CSO-www-L

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



LH as drawn

SIDE WALL CUT AWAY
FOR ILLUSTRATION

Refer to Rainhead
PDS for details

NOTE - The Corner Side Outlet may also be used in combination with
a Dam Buster Sump - refer to the Standard Details drawings

'Corner' Side Outlet dimensions

Side Outlet Size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter A width range (mm)	Box gutter B width (mm)
CSO-200-L	R-200 or CR-200	200	50	150	200	200 to 350	200
CSO-300-L	R-300 or CR-300	300	60	140	200	300 to 450	300
CSO-400-L	R-400 or CR-400	400	70	180	250	400 to 600	400

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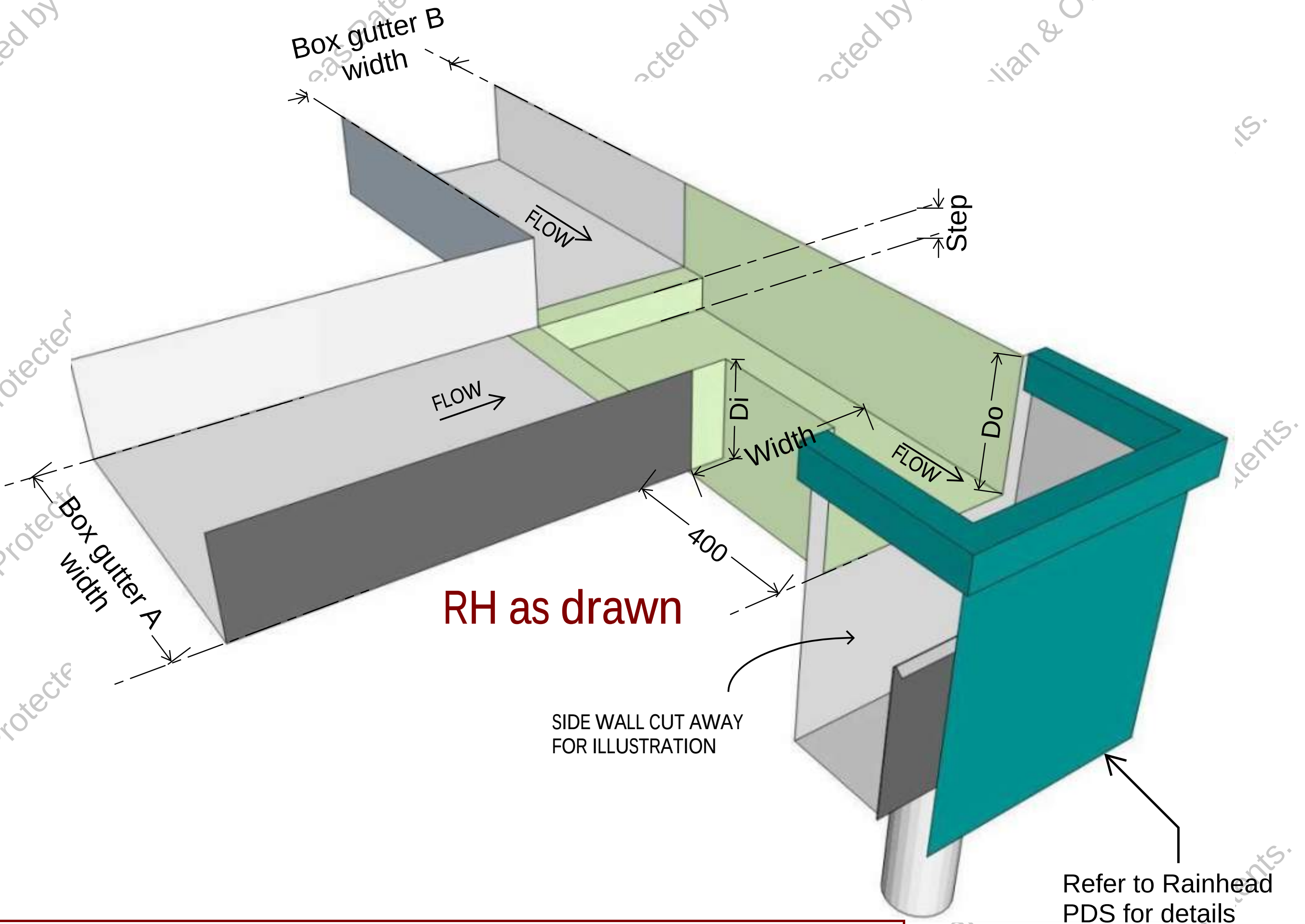
Product Data Sheet
'Corner' Side Outlets CSO-www-R

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



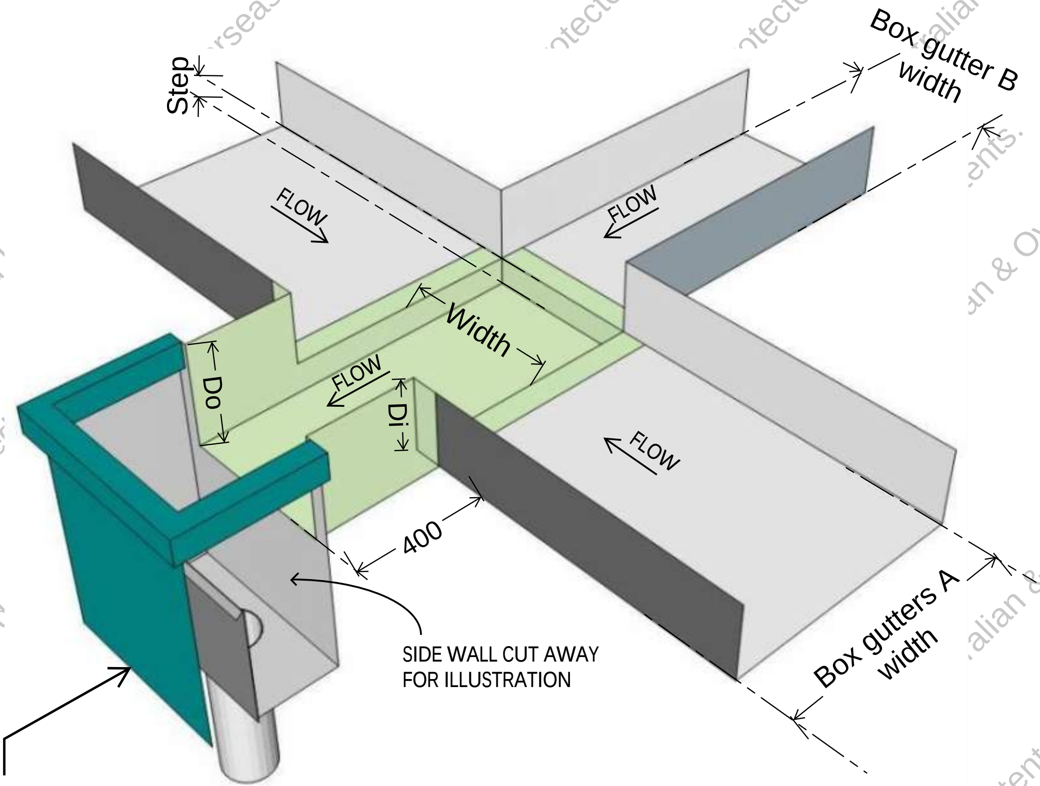
NOTE - The Corner Side Outlet may also be used in combination with a Dam Buster Sump - refer to the Standard Details drawings

'Corner' Side Outlet dimensions

Side Outlet Size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter A width range (mm)	Box gutter B width (mm)
CSO-200- R	R-200 or CR-200	200	50	150	200	200 to 350	200
CSO-300- R	R-300 or CR-300	300	60	140	200	300 to 450	300
CSO-400- R	R-400 or CR-400	400	70	180	250	400 to 600	400

Product Data Sheet
'Cruciform' Side Outlets XSO-www

Standard sizes to suit any box gutter width between 200mm to 600mm.
Must only be used in combination with a Dam Buster Rainhead



NOTE - The Cruciform Side Outlet may also be used in combination with a Dam Buster Sump - refer to the Standard Details drawings

'Cruciform' Side Outlet dimensions

Side Outlet Size	Rainhead size	Width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutters A width range (mm)	Box gutters B width range (mm)
XSO-200	R-200 or CR-200	200	50	150	200	200 to 350	200
XSO-300	R-300 or CR-300	300	60	140	200	300 to 450	300
XSO-400	R-400 or CR-400	400	70	180	250	400 to 600	400

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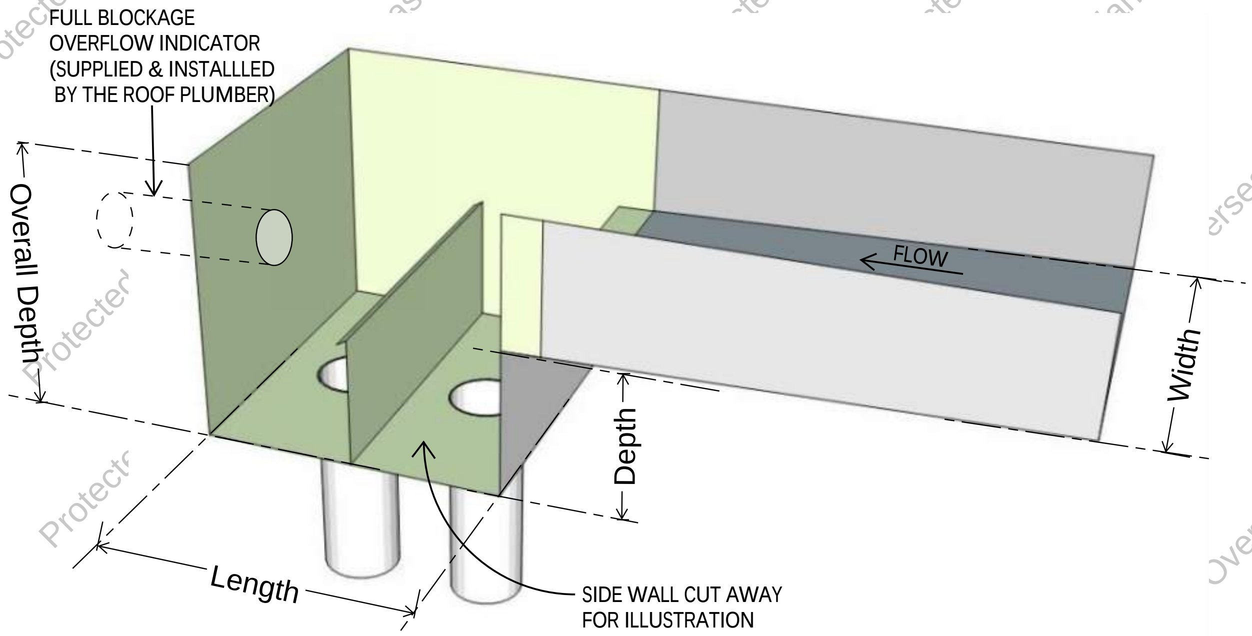
Product Data Sheet
Sumps SU-www-ddd

Standard sizes to suit box gutter widths of 200mm, 300mm, 400mm, 500mm & 600mm



Sump dimensions

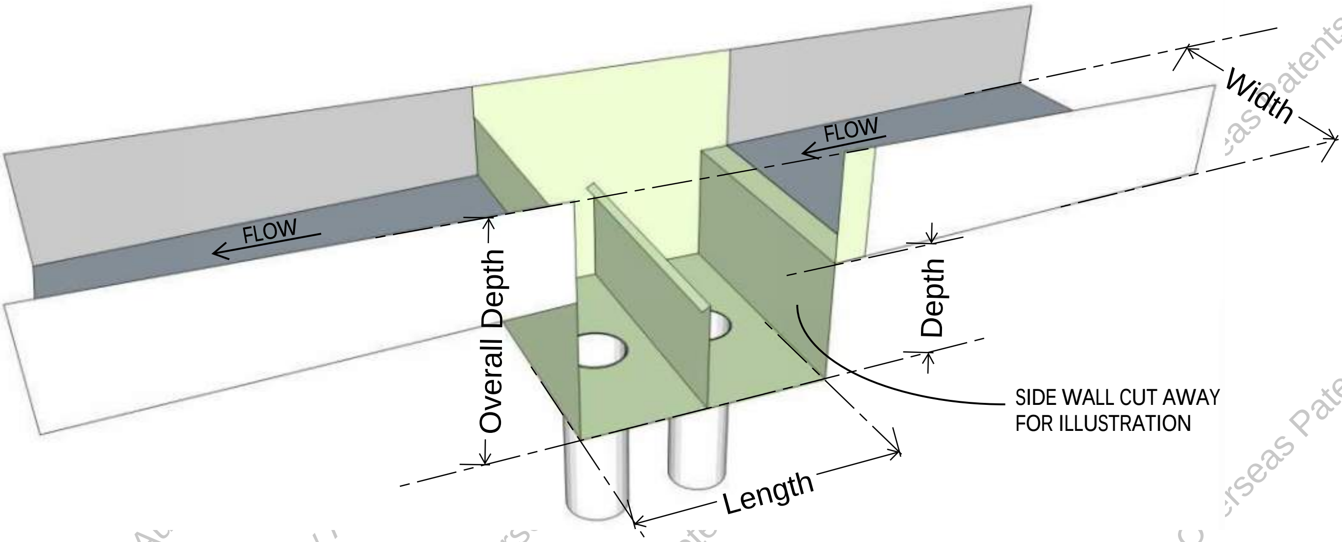
Sump size	Width (mm)	Depth (mm)	Length (mm)	Overall Depth (mm)
SU-200-100	205	100	400	300
SU-200-150	205	150	400	350
SU-300-75	305	75	400	280
SU-300-125	305	125	400	330
SU-300-200	305	200	400	405
SU-400-150	405	150	400	400
SU-400-200	405	200	400	450
SU-500-150	505	150	400	300
SU-500-200	505	200	400	400
SU-600-150	605	150	400	300
SU-600-200	605	200	400	400

Product Data Sheet

Continuous Sumps SU-www-ddd*

* Ordered as a Dam Buster Sump

Standard sizes to suit box gutter widths of 200mm, 300mm, 400mm, 500mm & 600mm



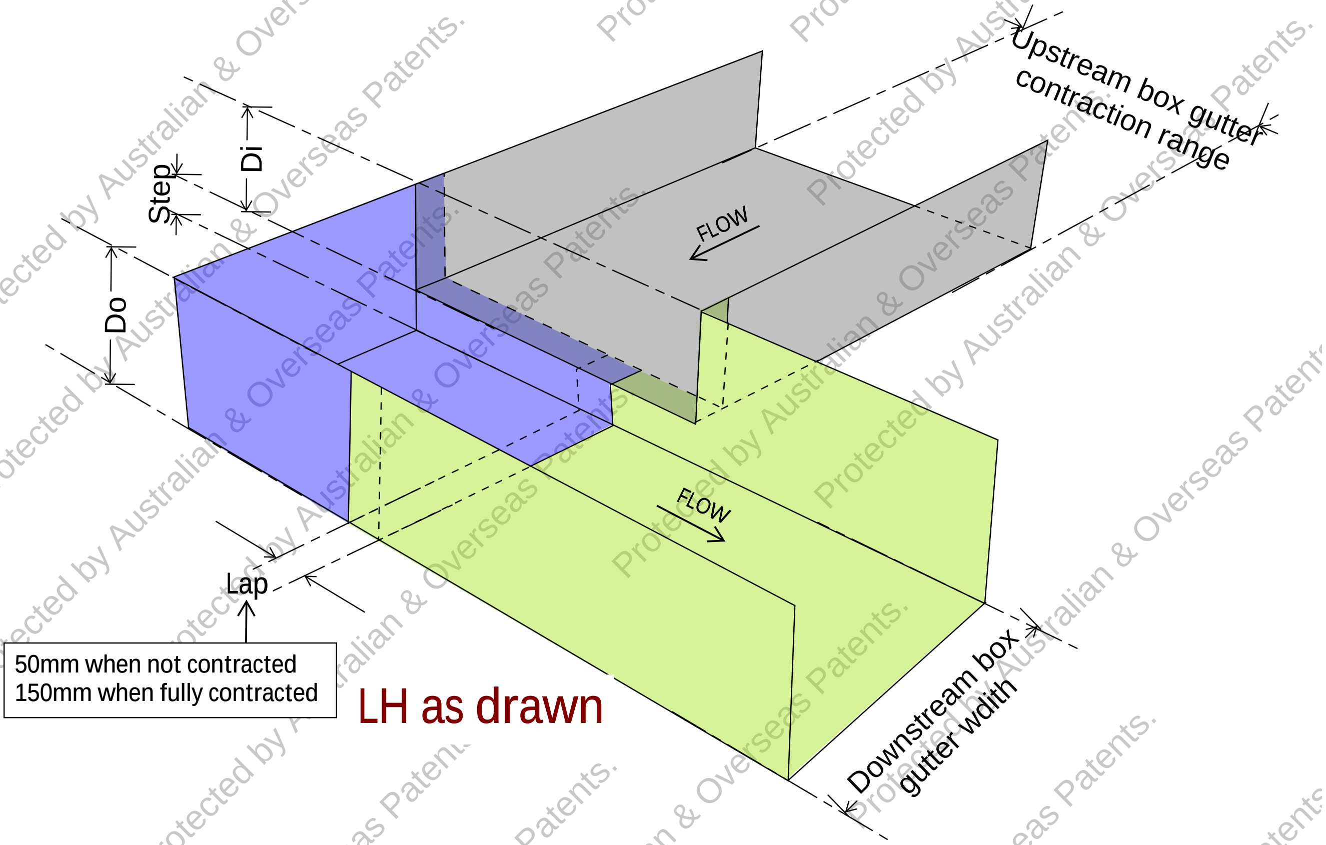
Continuous Sump dimensions

Sump size	Width (mm)	Depth (mm)	Length (mm)	Overall Depth (mm)
SU-200-100	205	100	400	300
SU-200-150	205	150	400	350
SU-300-75	305	75	400	280
SU-300-125	305	125	400	330
SU-300-200	305	200	400	405
SU-400-150	405	150	400	400
SU-400-200	405	200	400	450
SU-500-150	505	150	400	300
SU-500-200	505	200	400	400
SU-600-150	605	150	400	300
SU-600-200	605	200	400	400

Product Data Sheet

Elbows - ELB-www-L

Standard sizes to suit any box gutter width between 200mm to 600mm.

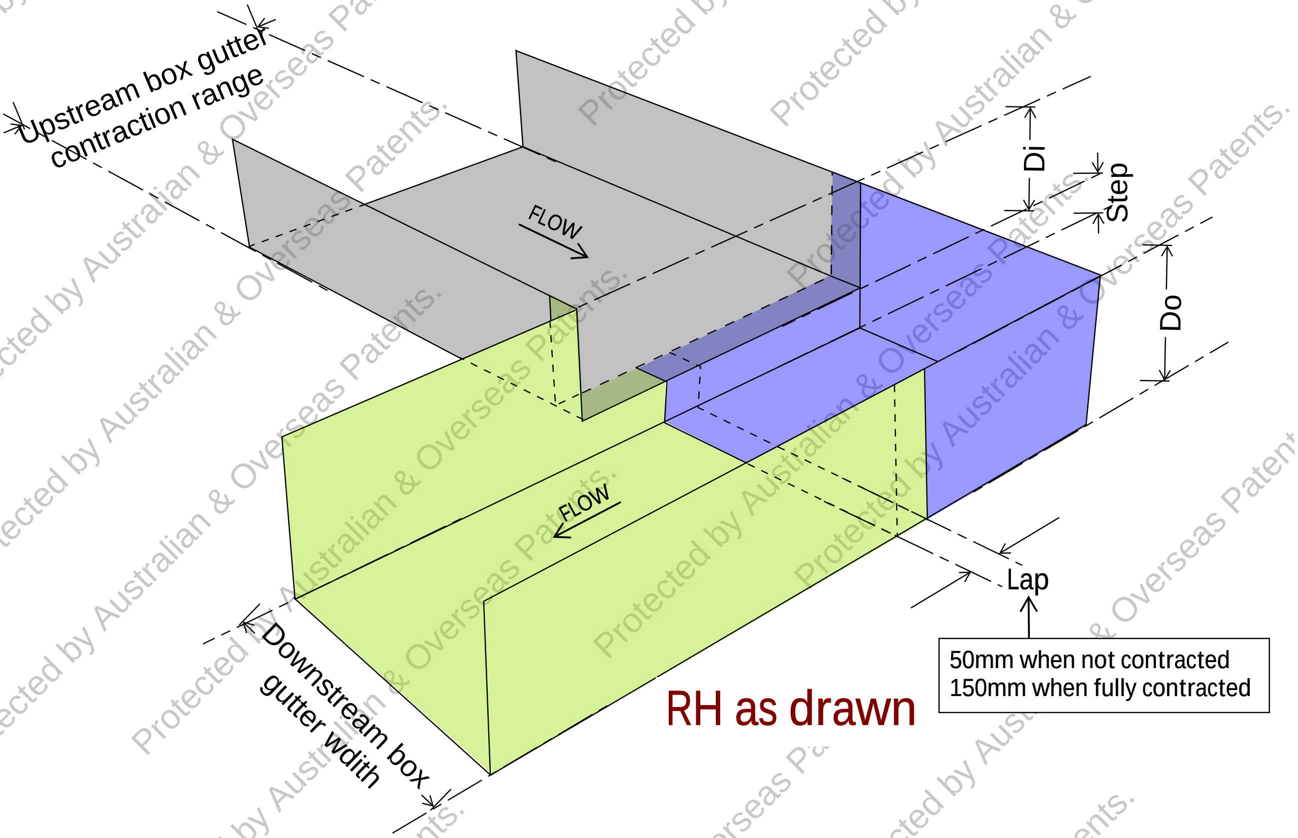


ELBOW dimensions

Elbow size	Upstream Contraction range (mm)	Downstream width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)
ELB-200- L	200 (fixed)	197	50	180	230
ELB-300- L	200 to 300	297	60	215	275
ELB-400- L	300 to 400	397	70	230	300
ELB-500- L	300 to 500	497	70	230	300
ELB-600- L	400 to 600	597	70	230	300

Product Data Sheet
Elbows - ELB-www-R

Standard sizes to suit any box gutter width between 200mm to 600mm.



50mm when not contracted
150mm when fully contracted

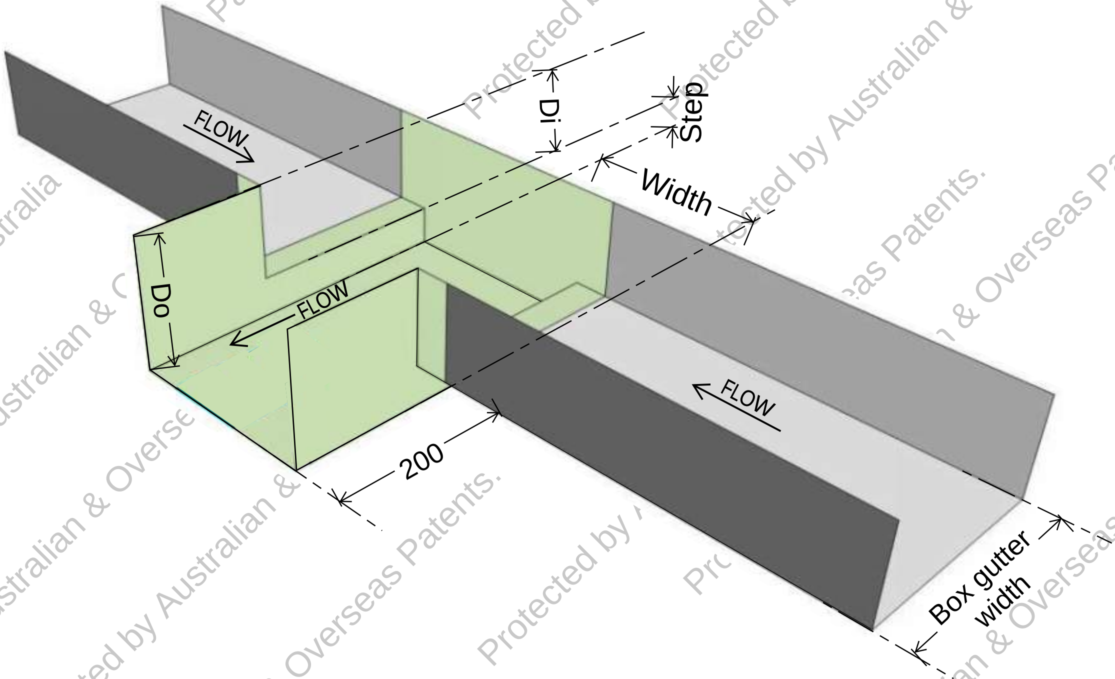
RH as drawn

ELBOW dimensions

Elbow size	Upstream Contraction range (mm)	Downstream width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)
ELB-200- R	200 (fixed)	197	50	180	230
ELB-300- R	200 to 300	297	60	215	275
ELB-400- R	300 to 400	397	70	230	300
ELB-500- R	300 to 500	497	70	230	300
ELB-600- R	400 to 600	597	70	230	300

Product Data Sheet
Tee Junction TJN-www

Standard sizes to suit any box gutter width between 200mm to 400mm.



TEE JUNCTION dimensions

Tee Junction size	Upstream Contraction range (mm)	Downstream width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)
TJN-200	200 (fixed)	197	50	180	230
TJN-300	200 to 300	297	60	215	275
TJN-400	300 to 400	397	70	230	300

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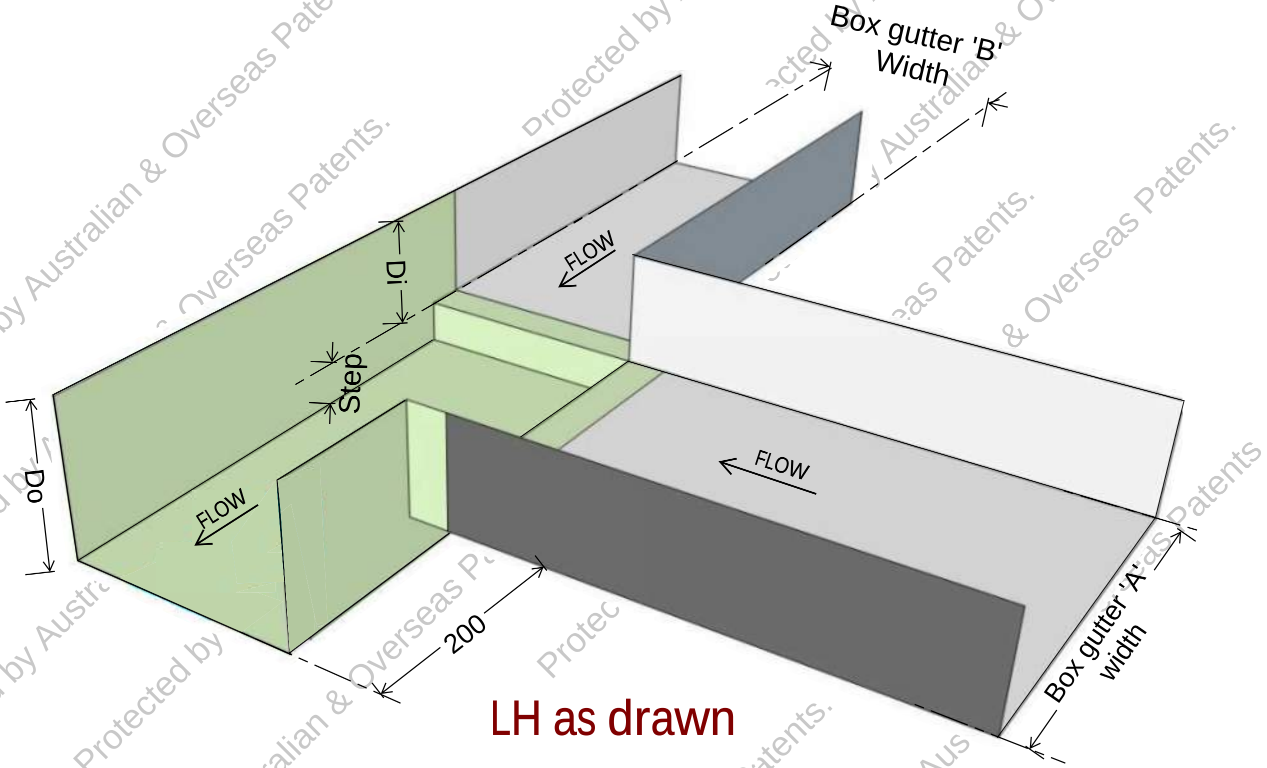
Product Data Sheet
Corner Junction CJN-www-L

Standard sizes to suit any box gutter width between 200mm to 400mm.



LH as drawn

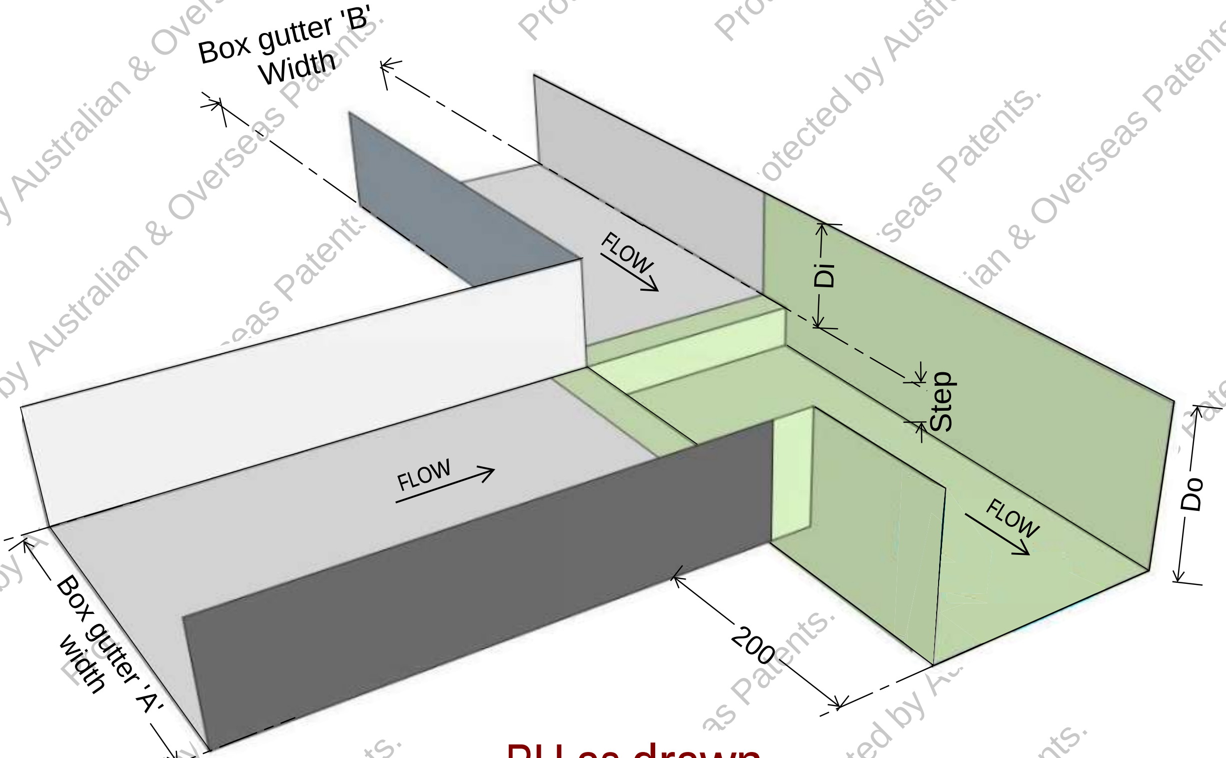
CORNER JUNCTION dimensions

Corner Junction Size	Downstream width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter A contraction range (mm)	Box gutter B width (mm)
CJN-200-L	197	50	180	230	200	200
CJN-300-L	297	60	215	275	200 to 300	300
CJN-400-L	397	70	230	300	300 to 400	400

Product Data Sheet

Corner Junction CJN-www-R

Standard sizes to suit any box gutter width between 200mm to 400mm.



RH as drawn

CORNER JUNCTION dimensions

Corner Junction Size	Downstream width (mm)	Nominal Step (mm)	INLET Depth, Di (mm)	OUTLET Depth, Do (mm)	Box gutter A contraction range (mm)	Box gutter B width (mm)
CJN-200-R	197	50	180	230	200	200
CJN-300-R	297	60	215	275	200 to 300	300
CJN-400-R	397	70	230	300	300 to 400	400