DAM BUSTER®

Achieve Compliance 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 2.2 (9 June 2023)

Refer to the Product Technical Statement for the full design information

ASSOCIATION OF HYDRAULIC SERVICES CONSULTANTS AUSTRALIA AHSCA 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

PERFORMANCE SOLUTION PROCESS & DOCUMENTATION

Required when Dam Buster devices are used*.

* NOTE - A Dam Buster Rainhead receiving discharge from a straight box gutter may be considered to be a Deemed-to-Satisfy Solution by Expert Judgement, provided this compliance approach is acceptable to the Regulatory Authority, and Building Certifier.

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.

DESIGN PROCESS USING DAM BUSTER BOX GUTTER DEVICES

STEP 1 - Determine design rainfall intensity

STEP 2 - Determine 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

STEP 3 - Design each box gutter discharging to a Dam Buster device

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

Design of Elbows & Junctions

STEP 5a - Design the Elbow (including box gutters) in accordance with the specific design procedure

STEP 5b - Design the Junction (including box gutters) in accordance with the specific design procedure

STEP 1 - Determine 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

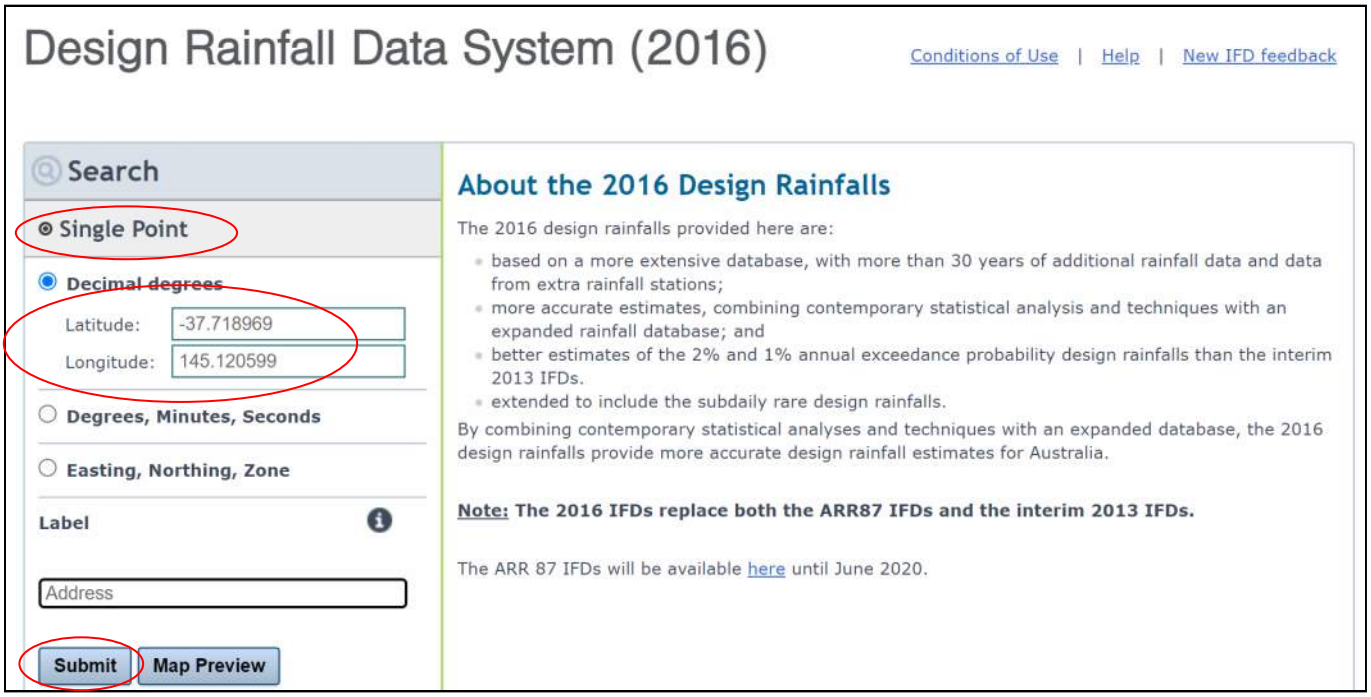
Method 2

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/



SELECT 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

MONTMORENCY, VIC ADDRESS

STEP 2 - Determine the design 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

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

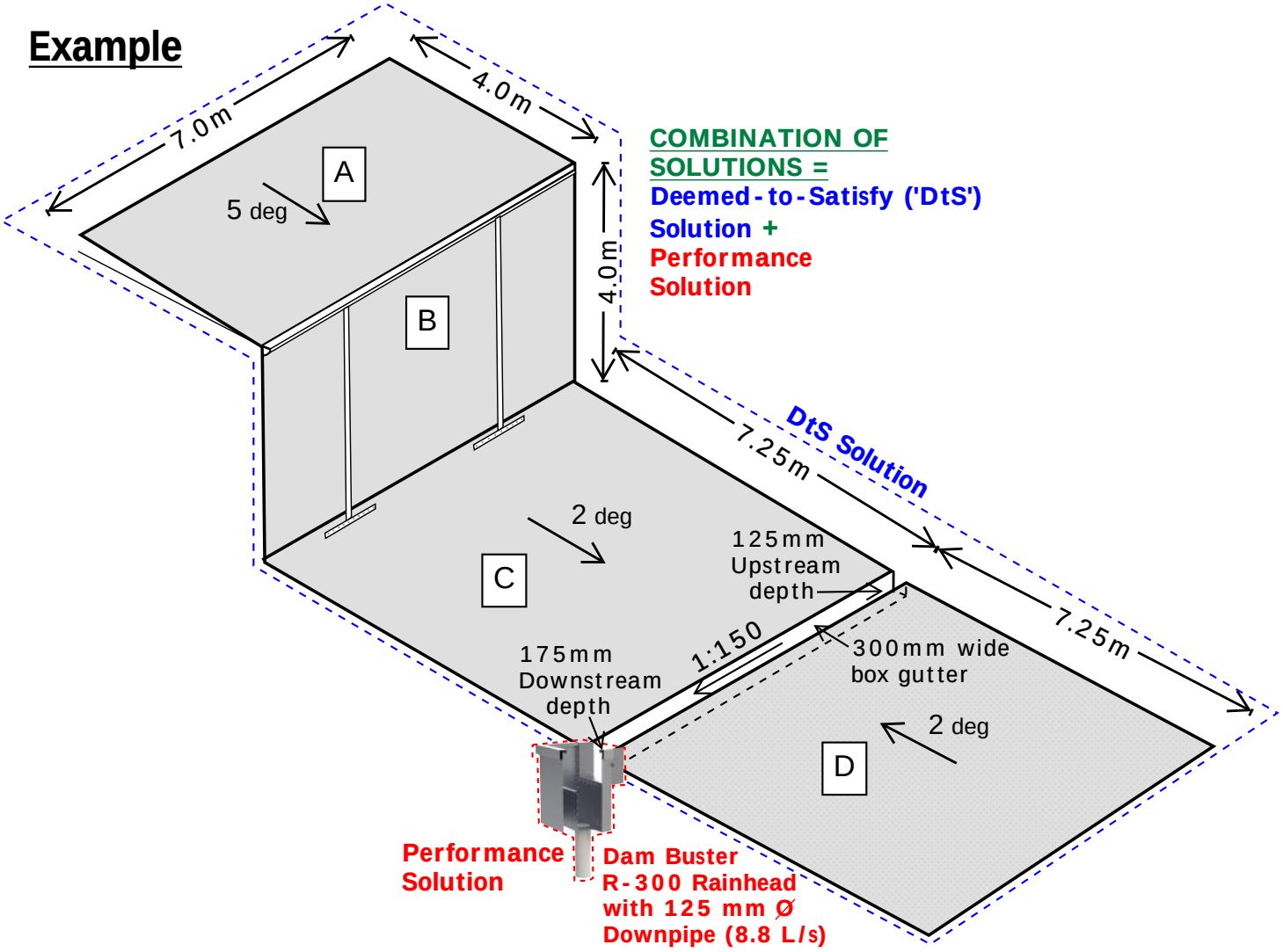
NOTE

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= **29.1m²**
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 = 28.0m²
Catchment area = 1/2 x 28.0 = **14.0m²**

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 = **144.6m²**

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)

STEP 3 - Design the 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

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- BCA Vol 2, Acceptable Construction Practice, specifies 1 in 1oo, however, this does not apply in Victoria, and is also only an alternative to the Acceptable Construction Manual i.e. AS/NZS 3500.3.

STEP 3 - Design the box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s	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	173	157	146	138	131	126	121	118	114
11.5	176	160	149	140	133	128	123	119	116
12.0	180	163	151	142	135	130	125	121	118
12.5	183	166	154	145	137	132	127	123	119
13.0	186	169	156	147	140	134	129	124	121
13.5	190	172	159	149	142	135	130	126	122
14.0	193	174	161	151	144	137	132	128	124
14.5	196	177	164	154	146	139	134	129	125
15.0	199	180	166	156	148	141	135	131	127
15.5	202	182	168	158	149	143	137	132	128
16.0	205	185	171	160	151	144	139	134	130

Example

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

STEP 3 - Design the box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s	Box gutter width (mm)								
	200	250	300 (Example)	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	165	150	140	132	126	121	117	113	110
11.5	168	153	142	134	128	123	119	115	112
12.0	171	156	145	136	130	125	120	117	113
12.5	174	158	147	139	132	126	122	118	115
13.0	177	161	149	141	134	128	124	120	116
13.5	180	164	152	143	136	130	125	121	118
14.0	183	166	154	145	138	132	127	123	119
14.5	186	169	156	147	139	133	128	124	121
15.0	189	171	158	149	141	135	130	126	122
15.5	192	174	161	151	143	137	132	127	123
16.0	195	176	163	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

STEP 3 - Design the box gutters (cont)

Design chart for box gutters discharging to Dam Buster devices

Design flow rate L/s	Box gutter width (mm)								
	200	250	300 (Example)	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	159	145	136	128	122	118	114	110	108
11.5	162	148	138	130	124	119	115	112	109
12.0	165	150	140	132	126	121	117	113	110
12.5	168	153	142	134	128	123	119	115	112
13.0	171	155	144	136	130	124	120	116	113
13.5	174	158	147	138	131	126	122	118	115
14.0	176	160	149	140	133	128	123	119	116
14.5	179	163	151	142	135	129	125	121	117
15.0	182	165	153	144	137	131	126	122	119
15.5	184	167	155	146	138	132	128	123	120
16.0	187	170	157	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

STEP 4 - Select the device / DP combination

a) Rainheads

Dam Buster Rainhead Design Table

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)				
80 diam.	80	4.00(2)			Refer note (iv)	
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-xxx have the same capacity as rectangular rainheads
(2) Capacities determined by testing by the AHSCA Research Foundation

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.

STEP 4 - Select the 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.	100	2.85				
" "	" "	125	(3.20)				
" "	" "	150	3.60				
90 diam.	100 diam.	100	3.40	(3.40)			
" "	" "	125	(4.60)	4.60			
" "	" "	150	5.05	(5.05)	5.05		
" "	" "	200	(5.90)	5.90	5.90		
100 diam.	100 diam.	125	(5.70)	5.70	(5.70)		
" "	" "	150	6.25	(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

Refer Note 3

Refer Note 4

Maximum permissible flow rates (litres / sec)

Notes

1) ▭ denotes sump size not currently available as a standard size. Refer to available standard sizes in table below.
2) There is one exception to 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.
3) 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.

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 Appendix F for an Aerial downpipe design chart.

4) These combinations may be used, however, provided the maximum flow rates stated for the same DP combinations in the same row of the table are adopted.
5) These combinations are not possible.
6) **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
100 mm	SU-200-100				
125 mm		SU-300-125			
150 mm	SU-200-150		SU-400-150	SU-500-150	SU-600-150
200 mm		SU-300-200	SU-400-200	SU-500-200	SU-600-200

STEP 4 - Select the 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 adjustable to larger box gutter widths as part of the Performance Solution. 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).

STEP 5a- Design of 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.**

STEP 5b - Design of 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.**

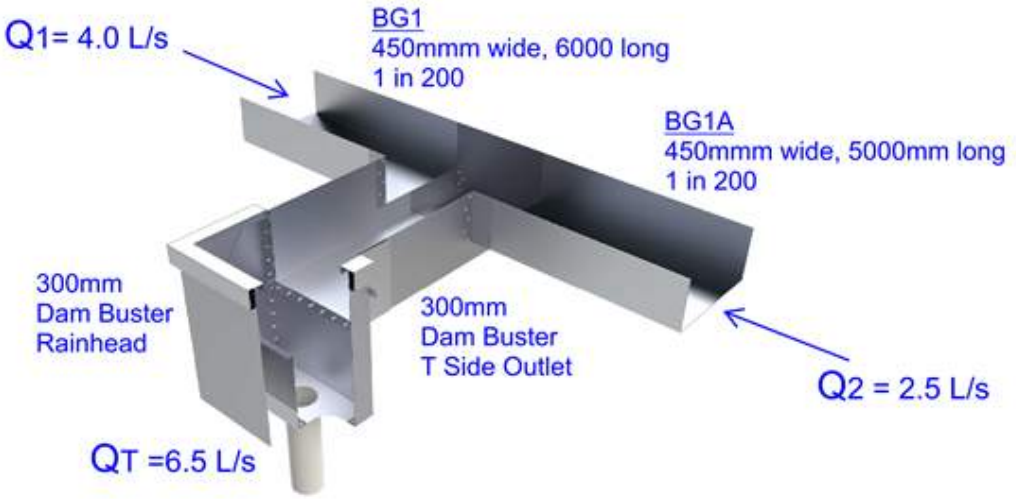
Design chart for aerial downpipes

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

Design example - Tee Side Outlet and Rainhead combination



STEP 1 - Design the box gutters

From design charts, minimum upstream depths:
BG1 - 94mm, adopt 95mm
BG2 - 88mm, adopt 90mm

Downstream depths:
BG1 = 95 + 6000/200 = 95 + 30 = 125mm
BG2 = 90 + 5000/200 = 90 + 25 = 115mm

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

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

STEP 2 - Select overflow device and DP

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

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

Note - All box gutters designed for Qmin = 3.0 L/s

Downpipe size	Equivalent diameter	Dam Buster Rainhead size				
		DB200	DB300	DB400	DB500	DB600
100 x 50	79 mm	4.00				
80 diam.	80 mm	4.00				
90 diam.	90 mm	4.70	6.50			
100 x 75	97 mm	5.00	7.30	8.00		
100 diam.	100 mm	5.00	7.60	8.80	8.80	
100 x 100	112 mm		8.80	12.0	12.0	
125 diam.	125 mm		9.50	13.8	15.4	15.9
150 x 100	137 mm			15.8	16.0	16.0
150 diam.	150 mm			16.0	16.0	16.0
Overflow Capacity of device (l/s)		> 16.0	> 16.0	> 16.0	> 16.0	> 16.0

Not recommended or not possible.

Maximum permissible flow rates (litres / sec)

Design example - Free Flow Sump

STEP 1 - Design the box gutters

From design charts, minimum upstream depths:
BG1 - 110mm

Downstream depths:
BG1 =110 + 8000/200 =110 + 40 = 150mm

Adopt
BG1 - (110 mm to 150 mm) Deep x 400mm wide

STEP 2 - Select overflow device and DP

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

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

Normal downpipe size	Overflow Downpipe size	Sump Depth (mm)	Dam Buster^{R} Sump width (mm)				
			200	300	400	500	600
90 diam.	90 diam.	100	2.85				
" "	" "	125	(3.20)				
" "	" "	150	3.60				
90 diam.	100 diam.	100	3.40	(3.40)			
" "	" "	125	(4.60)	4.60			
" "	" "	150	5.05	(5.05)	5.05		
" "	" "	200	(5.90)	5.90	5.90		
100 diam.	100 diam.	125	(5.70)	5.70	(5.70)		
" "	" "	150	6.25	(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

Dam Buster^{R} sump standard sizes					
Width / Depth	200 mm	300 mm	400 mm	500 mm	600 mm
100 mm	SU-200-100				
125 mm		SU-300-125			
150 mm	SU-200-150		SU-400-150	SU-500-150	SU-600-150
200 mm		SU-300-200	SU-400-200	SU-500-200	SU-600-200

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	RC-200-F	RC-300-F	RC-400-F	CR-500-F	CR-600-F
Sumps						
SU-www-ddd	Sump	SU-200-100	SU-300-125	SU-400-150	SU-500-150	SU-600-150
		SU-200-150	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						
CL-www	Chute Lid	CL-200	CL-300	CL-400	CL-500	CL-600

NOTES

1. The R-300 is also available in a number of (non-standard) widths between up to 480mm 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.
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).