

Roof TG. Gerard Roof

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SHEET
A4 1 of 1
Not To Scale
DATE
20-08-2013

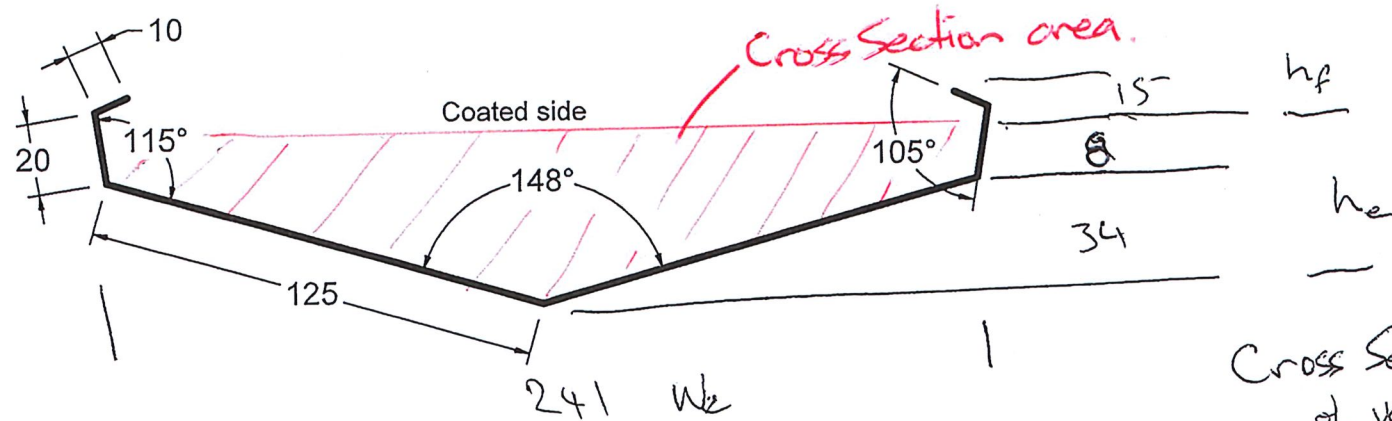
ISSUE

DATE

CHANGE

FELTON MATHEW AVE, GLEN INNES, AUCKLAND. 64 9 9789010

No Lubricants to be used for forming.



Cross Section area
of valley
AS/NZS 3500.3:2008

6145 mm²

Product Name	E2 Wide Valley
Drawing	75-04-207
Material/Blank	310 X 2400 mm
Finished Goods SAP No.	81935xx1
TEQA Sheet	TEQA 686

Estimation of Valley Catchment Area for given Rain Fall

Data based on Martin and Tilley report

ref AS/NZS3500.3:2015

Formula 14

Required information

Rain Fall 250 mm/hr 9.49 inches
 Water Width 241 mm

Valley Cross Section
 Valley description/Name

6145 mm²
Roof TG - Gerard Roofs - E2 Wide Valley

Formula 12 $a = (0.127Ap)^{0.66}$

Formula 14 $a = na' = (2w)^{0.33} (0.013Ap)^{0.66}$

$a = x$ section in in² $A =$ catchment in ft²
 $p =$ rainfall in in/hr $w =$ water width

Catchment "A" ← Catchment Area

Valley Type ← Valley Type

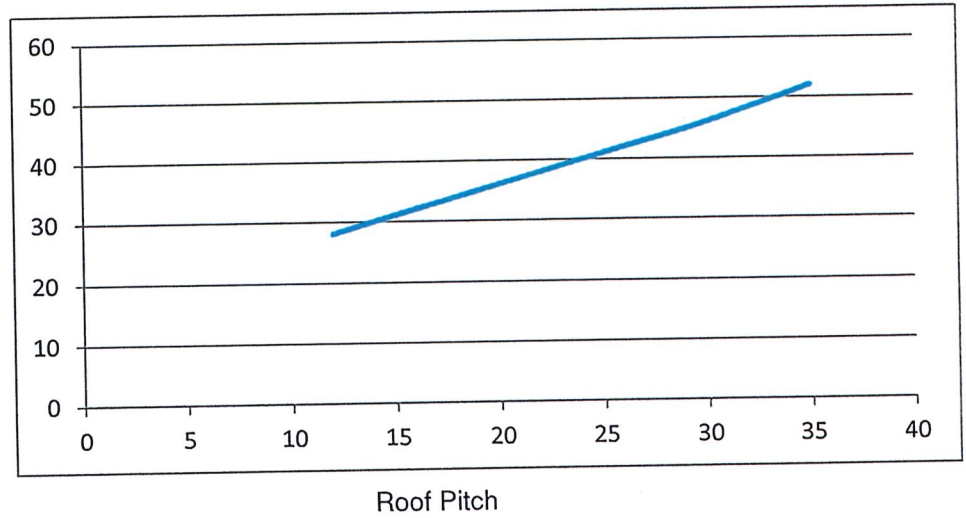
Catchment "A"		p in/hr	Ap	.013Ap	(.013Ap) ^{.66}	(2w) ^{.33}	na'	mm ²
m ²	ft ²							
28.0	301	9.84	2965.4	38.5496	11.1	2.6	29.4	18973
31.0	334	9.84	3283.1	42.6799	11.9	2.6	31.5	20292
36.0	387	9.84	3812.6	49.5638	13.1	2.6	34.7	22396
41.0	441	9.84	4342.1	56.4476	14.3	2.6	37.8	24404
46.0	495	9.84	4871.7	63.3315	15.5	2.6	40.8	26329
52.0	560	9.84	5507.1	71.5921	16.8	2.6	44.3	28548

Valley Cross Section
 Free Board 15 mm

Flat Gutter	Cross Section of Sloping Gutter sufficient to drain Catchment "A"						
	Sufficient Cross Section for pitch						
Roof Pitch	10°	12°	15°	20°	25°	30°	35°
10°	6388	6062	5715	5170	4743	4372	4045
12°	6832	6483	6112	5529	5073	4675	4327
15°	7541	7155	6746	6103	5599	5160	4775
20°	8217	7797	7351	6650	6101	5623	5203
25°	8865	8412	7931	7174	6582	6067	5614
30°	9612	9121	8599	7779	7137	6578	6087

Insufficient Cross Section

Roof Pitch	Valley Pitch	Catchment Area that matches Cross section of valley
12	9	28
15	11	31
20	14	36
25	18	41
30	22	46
35	27	52



Estimation of Valley Catchment Area for given Rain Fall

Data based on Martin and Tilley report
ref AS/NZS3500.3:2015

Formula 14
Required information

Rain Fall 300 mm/hr
Water Width 241 mm 9.49 inches

Valley Cross Section 6145 mm²
Valley description/Name Roof TG - Gerard Roofs - E2 Wide Valley

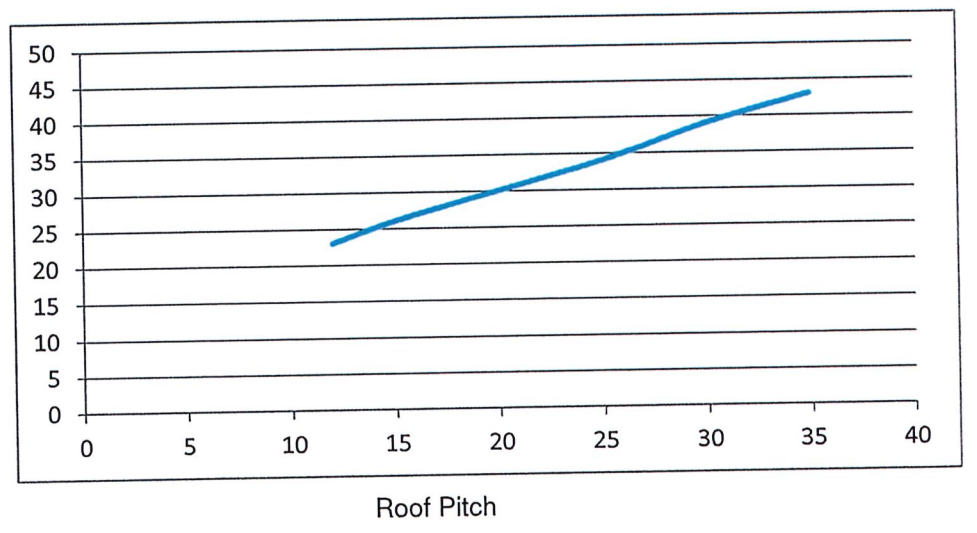
Formula 12 $a = (0.127Ap)^{0.66}$
Formula 14 $a = na' = (2w)^{0.33} (0.013Ap)^{0.66}$
 $a = x$ section in in² $A =$ catchment in ft²
 $p =$ rainfall in in/hr $w =$ water width

Valley Cross Section
Free Board 15 mm

										Cross Section of Sloping Gutter sufficient to drain Catchment "A"							
										Sufficient Cross Section for pitch							
										Roof Pitch							
										10°	12°	15°	20°	25°	30°	35°	
Catchment "A"	m ²	ft ²	p in/hr	Ap	.013Ap	(.013Ap) ^{.66}	(2 w) ^{.33}	na'	mm ²	Flat Gutter	10°	12°	15°	20°	25°	30°	35°
23.0	247	11.81	2923.0	37.9989	11.0	2.6	29.1	18794	18794	6328	6004	5661	5121	4698	4330	4007	
26.0	280	11.81	3304.3	42.9553	12.0	2.6	31.6	20378	20378	6861	6511	6138	5553	5094	4695	4345	
30.0	323	11.81	3812.6	49.5638	13.1	2.6	34.7	22396	22396	7541	7155	6746	6103	5599	5160	4775	
34.0	366	11.81	4320.9	56.1723	14.3	2.6	37.7	24325	24325	8190	7772	7327	6628	6081	5605	5187	
39.0	420	11.81	4956.4	64.4329	15.6	2.6	41.3	26631	26631	8967	8508	8021	7256	6658	6136	5678	
43.0	463	11.81	5464.7	71.0414	16.7	2.6	44.0	28403	28403	9563	9075	8555	7739	7101	6545	6056	
										Insufficient Cross Section							

Roof Pitch	Valley Pitch	Catchment Area that matches Cross section of valley
12	9	23
15	11	26
20	14	30
25	18	34
30	22	39
35	27	43

Catchment Area



Estimation of Valley Catchment Area for given Rain Fall

Data based on Martin and Tilley report

ref AS/NZS3500.3:2015

Formula 14

Required information

Rain Fall 340 mm/hr
 Water Width 241 mm 9.49 inches

Valley Cross Section
 Valley description/Name

6145 mm²
Roof TG - Gerard Roofs - E2 Wide Valley

$$\text{Formula 12 } a = (0.127Ap)^{0.66}$$

$$\text{Formula 14 } a = na' = (2w)^{0.33} (0.013Ap)^{0.66}$$

a = x section in in² A = catchment in ft²
 p = rainfall in in/hr w = water width

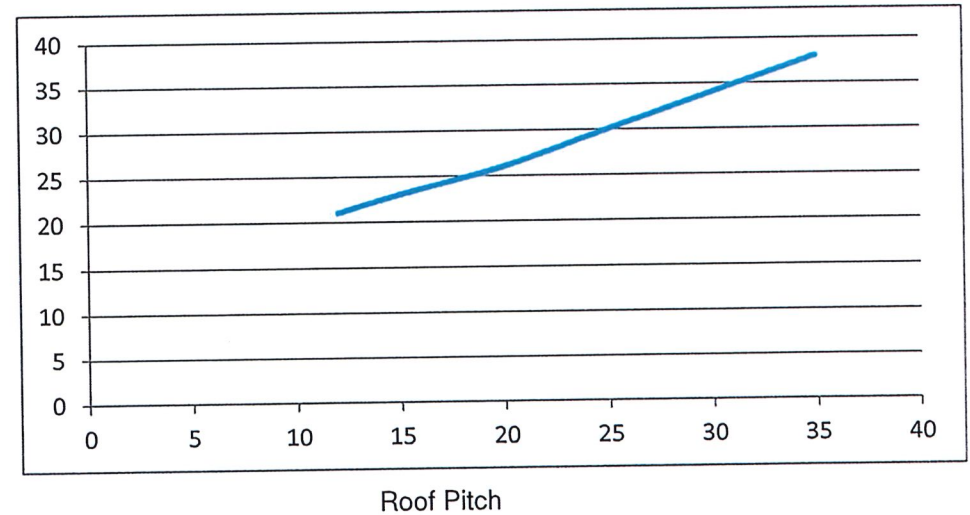
Valley Cross Section
 Free Board 15 mm

Catchment "A"		p in/hr	Ap	.013Ap	(.013Ap) ^{.66}	(2w) ^{.33}	na'	mm ²	Cross Section of Sloping Gutter sufficient to drain Catchment "A"						
m ²	ft ²								Roof Pitch						
									Sufficient Cross Section for pitch						
									10°	12°	15°	20°	25°	30°	35°
21.0	226	13.39	3024.7	39.3206	11.3	2.6	29.8	19223	6472	6142	5790	5238	4806	4429	4099
23.0	247	13.39	3312.7	43.0654	12.0	2.6	31.6	20412	6873	6522	6148	5562	5103	4703	4352
26.0	280	13.39	3744.8	48.6826	13.0	2.6	34.3	22133	7452	7071	6667	6031	5533	5100	4719
30.0	323	13.39	4320.9	56.1723	14.3	2.6	37.7	24325	8190	7772	7327	6628	6081	5605	5187
34.0	366	13.39	4897.1	63.6619	15.5	2.6	41.0	26420	8896	8441	7958	7199	6605	6088	5633
38.0	409	13.39	5473.2	71.1516	16.7	2.6	44.1	28432	9573	9084	8564	7747	7108	6551	6062

Insufficient Cross Section

Roof Pitch	Valley Pitch	Catchment Area that matches Cross section of valley
12	9	21
15	11	23
20	14	26
25	18	30
30	22	34
35	27	38

Catchment Area



Estimation of Valley Catchment Area for given Rain Fall

Data based on Martin and Tilley report

ref AS/NZS3500.3:2015

Formula 14

Required information

Rain Fall 340 mm/hr
 Water Width 328 mm 12.91 inches

Valley Cross Section
 Valley description/Name

7872 mm²
NCC 400 mm Wide Valley

$$\text{Formula 12 } a = (0.127Ap)^{0.66}$$

$$\text{Formula 14 } a = na' = (2w)^{0.33} (0.013Ap)^{0.66}$$

a = x section in in² A = catchment in ft²
 p = rainfall in in/hr w = water width

Valley Cross Section
 Free Board 15 mm

Catchment "A"		p in/hr	Ap	.013Ap	(0.013Ap) ^{.66}	(2w) ^{.33}	na'	mm ²	Cross Section of Sloping Gutter sufficient to drain Catchment "A"						
m ²	ft ²								Roof Pitch						
									Sufficient Cross Section for pitch						
									10°	12°	15°	20°	25°	30°	35°
26.0	280	13.39	3744.8	48.6826	13.0	2.9	38.0	24502	8250	7828	7380	6676	6126	5646	5224
28.0	301	13.39	4032.9	52.4275	13.6	2.9	39.9	25731	8664	8221	7750	7011	6433	5929	5486
33.0	355	13.39	4753.0	61.7895	15.2	2.9	44.5	28678	9656	9162	8638	7814	7169	6608	6115
38.0	409	13.39	5473.2	71.1516	16.7	2.9	48.8	31476	10598	10056	9481	8577	7869	7253	6711
43.0	463	13.39	6193.4	80.5136	18.1	2.9	52.9	34152	11499	10911	10287	9306	8538	7869	7282
48.0	516	13.39	6913.5	89.8757	19.5	2.9	56.9	36724	12365	11733	11061	10006	9181	8462	7830

Insufficient Cross Section

Roof Pitch	Valley Pitch	Catchment Area that matches Cross section of valley
12	9	26
15	11	28
20	14	33
25	18	38
30	22	43
35	27	48

Catchment Area

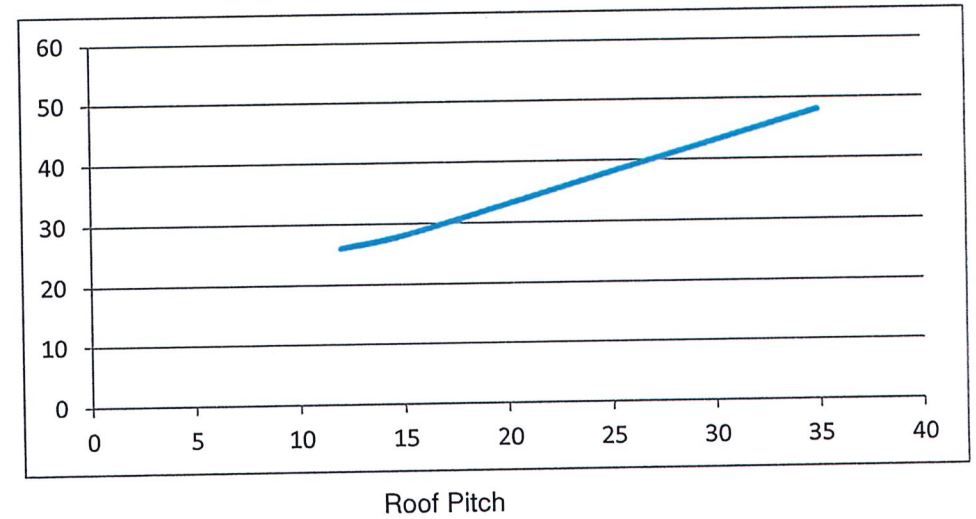


TABLE E1 (continued)

Location	Latitude degrees	Longitude degrees	20 year ARI (5% AEP) intensity mm/h	100 year ARI (1% AEP) intensity mm/h
Kalbarrija	24.87	129.08	175	258
Katherine	14.46	132.26	216	250
Maranka	14.92	133.07	220	259
Nhulunbuy	12.18	136.78	227	271
Palmerston	12.48	130.98	232	270
Tennant Creek	19.64	134.19	173	223
Yulara	25.24	130.99	214	322
QUEENSLAND				
Alpha	23.65	146.64	196	263
Baraldine	23.56	145.29	194	260
Beaudesert	27.99	153.00	203	266
Bedourie	24.36	139.47	180	264
Biloela	24.40	150.51	204	259
Birdsville	25.90	139.35	138	211
Blackall	24.42	145.46	188	253
Blackwater	23.58	148.88	203	264
Boulia	22.91	139.91	176	247
Bowen	20.01	148.24	229	284
Brisbane				
Beenleigh	27.72	153.20	232	305
Brisbane City	27.47	153.03	235	306
Manly	27.45	153.18	244	318
Redland Bay	27.61	153.30	246	323
Sandgate	27.32	153.07	241	313
Springfield Central	27.68	152.90	221	289
Bundaberg	24.86	152.35	266	340
Burketown	17.75	139.55	246	306
Caboolture	27.08	152.95	242	316
Cairns	16.92	145.77	229	278
Caloundra	26.80	153.12	262	341
Carnoolweal	19.92	138.12	178	232
Canungra	28.02	153.16	212	277
Cape York	10.69	142.53	269	316
Charleville	26.40	146.25	176	236
Charters Towers	20.07	146.27	199	250
Chinchilla	26.74	150.63	228	301
Clermont	22.82	147.64	200	257
Cloncurry	20.71	140.51	218	278
Cooktown	15.47	145.25	228	277
Crows Nest	27.26	152.05	204	264

(continued)

TABLE E1 (continued)

Location	Latitude degrees	Longitude degrees	20 year ARI (5% AEP) intensity mm/h	100 year ARI (1% AEP) intensity mm/h
Cunnamulla	28.07	145.69	197	277
Curumbin	28.14	153.48	251	331
Dalby	27.18	151.26	211	280
Dirranbandi	28.58	148.23	217	295
Eidsvold	25.37	151.12	216	281
Emerald	23.53	148.16	215	282
Gatton	27.56	152.28	211	281
Gladstone	23.85	151.26	215	271
Goondiwindi	28.53	150.31	193	257
Gympie	26.20	152.67	218	278
Hervey Bay	25.29	152.83	244	314
Hughenden	20.84	144.20	206	265
Hungerford	29.00	144.41	180	274
Ipswich	27.61	152.76	211	277
Ingham	18.65	146.16	245	307
Innisfail	17.52	146.03	248	301
Kilcoy	26.94	152.56	214	272
Kingaroy	26.54	151.84	220	284
Longreach	23.44	144.25	192	251
Mackay	21.14	149.19	250	314
Mareeba	17.00	145.43	197	245
Maroochydore	26.65	153.09	259	337
Mission Beach	17.87	146.10	241	293
Mission River (Welpa)	12.65	141.88	238	281
Mitchell	26.49	147.97	168	227
Moonie	27.72	150.37	209	281
Mount Isa	20.72	139.50	200	262
Mundubbera	25.59	151.30	232	301
Nambour	26.63	152.96	250	324
Nerang	28.00	153.34	242	319
Noosa Heads	26.40	153.09	258	331
Normanton	17.67	141.08	228	283
Port Douglas	16.48	145.46	250	304
Proserpine	20.40	148.58	232	290
Quilpie	26.62	144.27	191	287
Ravenshoe	17.61	145.48	170	212
Richmond	20.74	143.14	215	275
Roma	26.57	148.78	212	286
Rockhampton	23.37	150.51	230	301

(continued)

TABLE E1 (continued)

Location	Latitude degrees	Longitude degrees	20 year ARI (5% AEP) intensity mm/h	100 year ARI (1% AEP) intensity mm/h
St. George	28.04	148.58	222	300
Southport	27.97	153.41	256	337
Springure	24.12	148.09	210	281
Stanthorpe	28.65	151.93	184	244
Tambo	24.88	146.26	185	250
Tamborine Mountain	27.97	153.20	223	293
Texas	28.86	151.17	185	241
Thargomindah	27.99	143.82	180	277
Toowoomba	27.55	151.95	202	266
Townsville	19.26	146.82	235	300
Warwick	28.22	152.02	191	253
Windorah	25.43	142.66	174	265
Winton	22.39	143.04	216	299
Yarraman	26.84	151.98	214	274
Yeppoon	23.14	150.74	244	319

SOUTH AUSTRALIA

Adelaide				
Adelaide City	34.93	138.60	120	174
Christies Beach	35.14	138.47	118	169
Fairview Park	34.80	138.73	119	170
Gawler	34.60	138.75	110	158
Glenslg	34.98	138.51	120	175
Port Adelaide	34.85	138.50	124	185
Ardrossan	34.42	137.91	112	160
Balaklava	34.14	138.42	114	166
Berri	34.28	140.60	125	185
Blinman	31.09	138.68	151	226
Bordertown	36.31	140.78	115	164
Burra	33.68	138.94	115	167
Cape Jervis	35.61	138.11	120	170
Ceduna	32.13	133.68	114	167
Clare	33.83	138.61	113	162
Coober Pedy	29.01	134.75	115	174
Cowell	33.67	136.92	116	169
Delamere	35.56	138.21	130	184
Editburgh	35.08	137.74	116	168
Goolwa	35.50	138.78	109	156
Hahndorf	35.03	138.81	114	157
Hawker	31.89	138.42	144	216
Iron Knob	32.73	137.15	127	191

(continued)