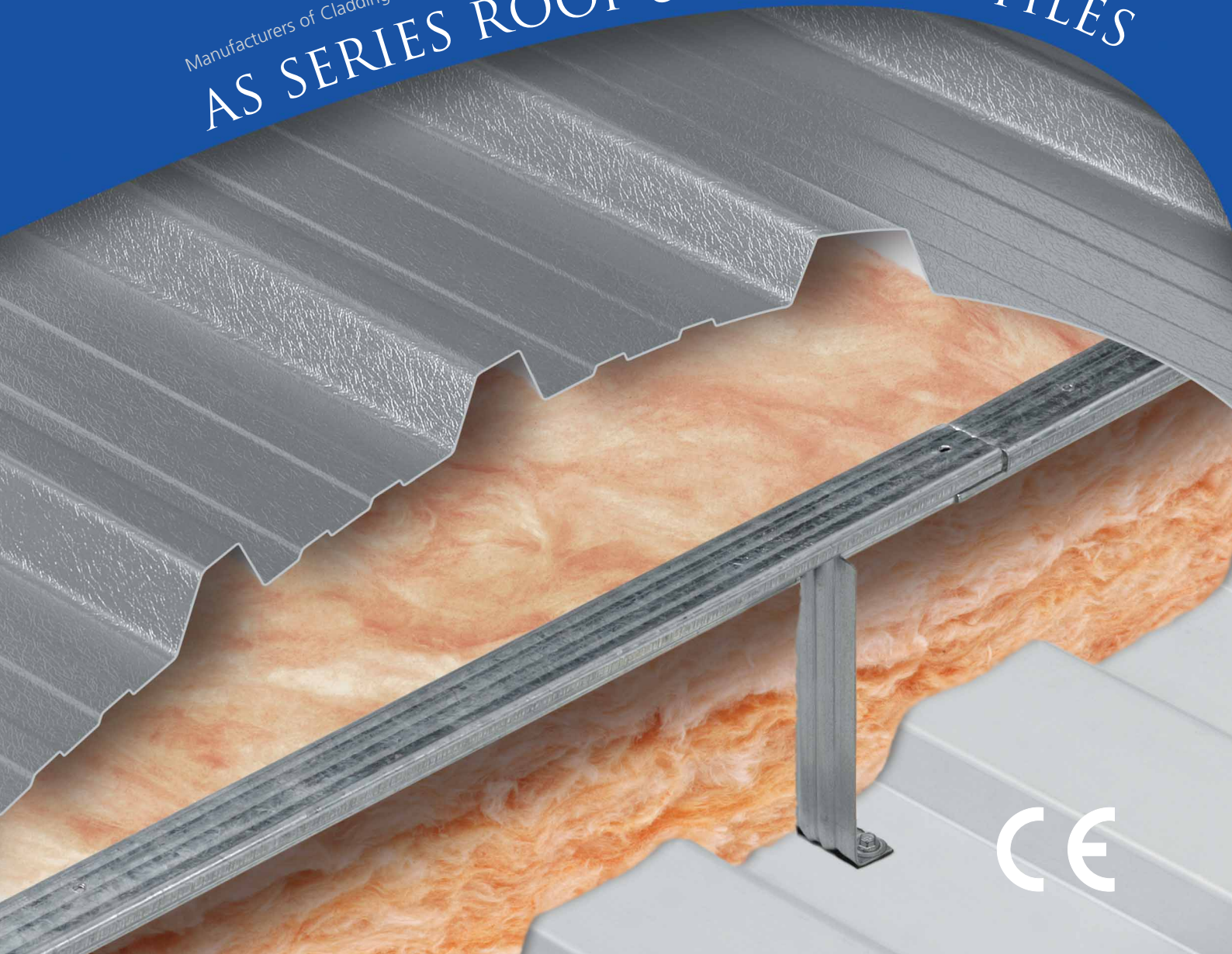


# TWIN SKIN SYSTEMS

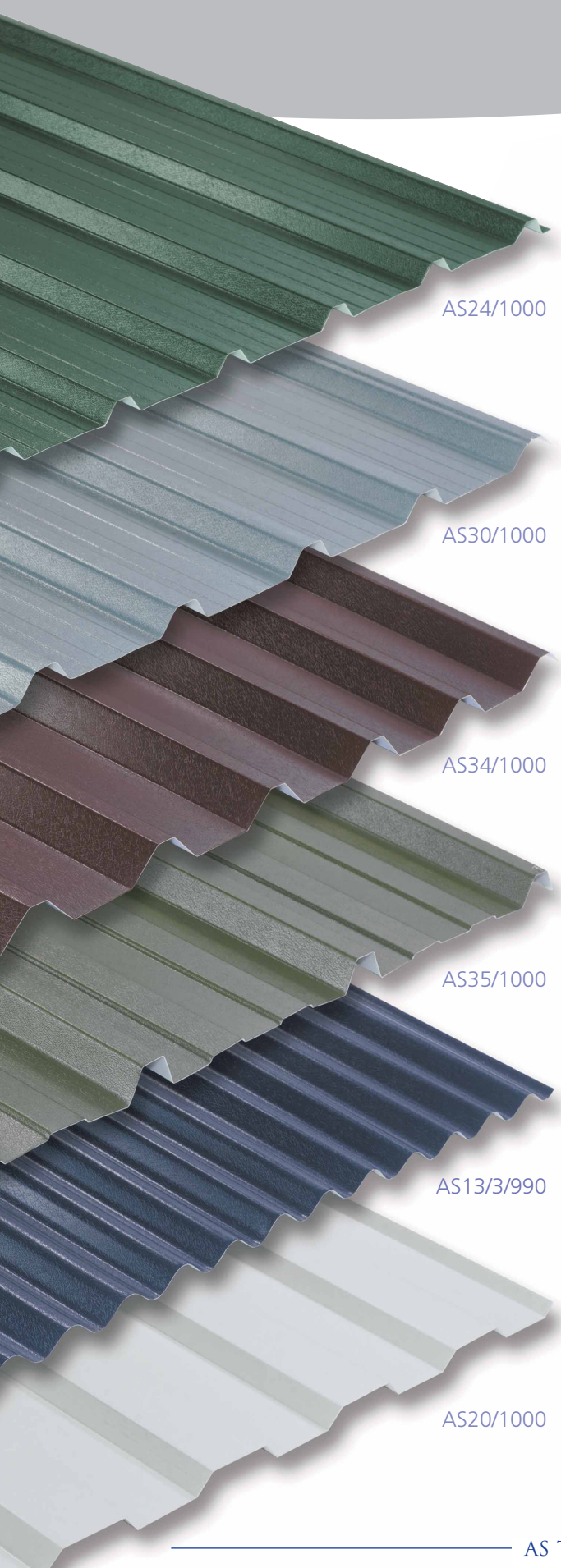
Manufacturers of Cladding Products for the Construction Industry

## AS SERIES ROOF & WALL PROFILES



# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES



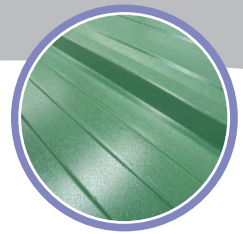
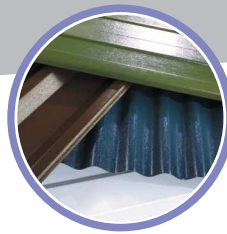
### INTRODUCTION

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### ABOUT STEADMANS

A Steadman & Son Limited (usually known as Steadmans) are one of the UK's leading manufacturers of roofing and cladding, supplying high quality cladding materials from our sites in England, Scotland and Northern Ireland. We offer total roofing and cladding solutions which we deliver with our dedicated haulage fleet.

Our continuous investment programme and on-going product development ensures we can provide high quality products promptly and at competitive prices.



## AS TWIN SKIN SYSTEMS

Steadmans' AS twin skin roof and wall systems consist of coated steel sheets rolled to six different profiles; they may be used to form roofs - down to 4° pitch (6° if rooflights are required) - and walls. The system includes a comprehensive range of spacers, fixings, sealants, guttering, flashings and rooflights.

The AS twin skin system offers rapid coverage and swift completion of a weatherproof building envelope to give a high performance building. The profiles may also be used in single skin applications.

The QA+ warranty can be extended to a ten year insurance backed warranty covering defects arising from poor workmanship, defective materials and damage resulting from design defects. Contact Steadmans for more information about the warranties.



## SPECIFICATION

NBS Plus is a library of technical product information written in NBS format, linked to NBS clauses and clause guidance.



With NBS Plus, specifiers can select products quickly and accurately then drop the product information directly into a specification.

NBS clauses for AS twin skin roof and wall systems and other Steadmans products are now available for NBS subscribers.

## REQUIREMENTS

AS twin skin roof and wall profiles are manufactured in a process certified to ISO 9001:2008.

### Installation warranty

Steadmans offer an independent audit-based warranty for the AS twin skin roofing and cladding system.

The QA+ warranty, from Auditing Workmanship & Materials Ltd, provides pre-site and on-site quality inspections and audits to ensure the high standards of construction and finishing which will maximise service life and reduce maintenance costs.

## TECHNICAL DESCRIPTION

### Steel profiles

Standard external weather sheets are available in 0.5mm and 0.7mm thicknesses; the AS20/1000 liner sheet is available in 0.4mm and 0.7mm thicknesses.

Tables 01 and 02 give the standard profile dimensions, weights, and manufacturing tolerances.

**Table 01: Profile dimensions**

Cover:	
• AS13/3	990mm
• all other panels	1000mm
Standard lengths	1000 - 12000mm (others available on request)
Weight:	
• 0.4mm thick	3.49 kg/m <sup>2</sup>
• 0.5mm thick	4.57 kg/m <sup>2</sup>
• 0.7mm thick	6.49 kg/m <sup>2</sup>

**Table 02: Manufacturing tolerances**

Cut to length	
• L < 3m	+/- 5mm
• L > 3m	+/- 10mm
Cover width	-0mm / +3mm
End square	-3mm / +3mm

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### TECHNICAL DESCRIPTION

#### Steel profiles

The steel used in the AS series roof and wall profiles is hot-dip galvanised to BS EN 10346:2009 or Aluzinc coated, then finished with one of the coatings listed in Table 03.

Weather sheets are available in a number of different profiles, many with matching roof and wall panel profiles. The following pages show the details and load tables for each profile.

In order to maintain our high standards of customer service we may replace the steel listed here with that of similar quality from different suppliers.

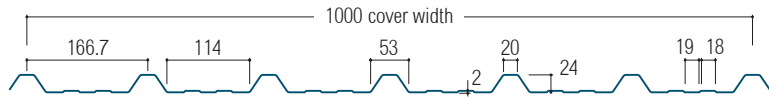


**Table 03: Twin skin steel coatings**

Weather sheet	200LG 200 micron PVC Plastisol	A high performance pre-painted steel system on a hot dipped galvanised substrate. The outer face is finished with a leather-grain embossed PVC while the inner face is finished with a heat cured epoxy paint system.
	Dobel Nova	A 50 micron thick acrylic polymer coating which has high wear resistance, excellent colourfastness and good flexibility. The coating contains no PVC or Isocyanates and the material is wholly recyclable.
	Polyester	A polyester coating with a medium term life.
	Agri-Steel	A polyester coating recommended for the agricultural market. Agri-Steel has a superior substrate coating and interior paint finish when compared to standard polyester.
	Tata HPS200	A durable organic coating with Scintilla finish on a substrate treated with hot-dipped zinc-aluminium alloy.
	Tata & Dobel PVDF	A 27 micron thick stoved fluoro-carbon coating: excellent colour stability at temperatures as high as 120°C.
	Liner sheet	White lining enamel
200LG Plastisol		200 micron thick coating for areas with high internal humidity or a corrosive environment.
Dobel Foodsafe		150 micron coating, suitable for the interiors of cold stores, food processing buildings and other hygiene applications.

## PERFORMANCE

### AS24/1000R ROOF PROFILE



A medium profile roof sheet available in 0.5mm and 0.7mm thicknesses. A matching wall profile is available (see page 6 for load span tables).

**Table 04: AS24/1000R steel roof profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.513 kNm/m Moment of inertia 3.514 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.527 kNm/m Moment of inertia 3.514 cm <sup>4</sup> /m		Support width 40mm	Web crushing 8.318 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.07	1.53	1.18	0.94	0.77	0.62	0.49	0.40	0.33
double	2.12	1.57	1.21	0.96	0.79	0.65	0.56	0.48	0.42
triple	2.65	1.95	1.50	1.19	0.97	0.81	0.69	0.59	0.51
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.56	0.96	0.63	0.43	0.30	0.21	0.15	0.11	0.08
double	1.43	1.10	0.86	0.70	0.53	0.39	0.29	0.22	0.16
triple	1.74	1.34	1.06	0.74	0.53	0.39	0.29	0.22	0.16
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.73	1.99	1.51	1.18	0.94	0.77	0.64	0.53	0.45
double	2.18	1.67	1.32	1.06	0.87	0.73	0.61	0.52	0.44
triple	2.65	2.04	1.61	1.31	1.08	0.90	0.77	0.66	0.56

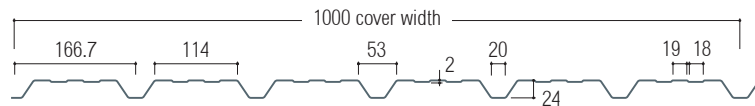
**Table 05: AS24/1000R steel roof profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.777 kNm/m Moment of inertia 5.229 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.823 kNm/m Moment of inertia 5.229 cm <sup>4</sup> /m		Support width 40mm	Web crushing 17.275 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.13	2.31	1.78	1.42	1.16	0.92	0.73	0.59	0.48
double	3.31	2.45	1.88	1.50	1.22	1.02	0.86	0.74	0.65
triple	4.13	3.05	2.34	1.86	1.52	1.26	1.07	0.92	0.80
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.32	1.44	0.94	0.64	0.45	0.32	0.23	0.17	0.12
double	2.40	1.82	1.42	1.11	0.79	0.58	0.43	0.33	0.25
triple	2.93	2.23	1.61	1.11	0.79	0.58	0.43	0.33	0.25
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.27	3.11	2.36	1.85	1.48	1.21	1.00	0.84	0.71
double	3.65	2.77	2.17	1.74	1.39	1.14	0.94	0.79	0.67
triple	4.46	3.40	2.67	2.15	1.76	1.44	1.20	1.01	0.86

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### AS24/1000W WALL PROFILE



A medium profile wall sheet available in 0.5mm and 0.7mm thicknesses. A matching roof profile is available (see page 5 for load span tables).

**Table 06: AS24/1000W steel wall profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

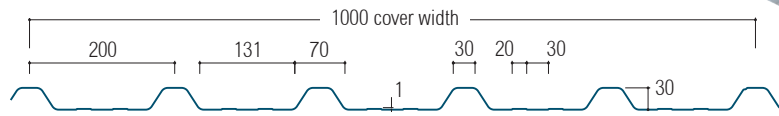
Top flange in compression Moment capacity 0.513 kNm/m Moment of inertia 3.514 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 0.527 kNm/m Moment of inertia 3.514 cm <sup>4</sup> /m		Support width 40mm	Web crushing 8.318 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.09	1.54	1.13	0.79	0.58	0.43	0.33	0.26	0.21
double	2.04	1.50	1.15	0.90	0.73	0.61	0.51	0.43	0.37
triple	2.54	1.87	1.43	1.13	0.92	0.76	0.64	0.54	0.47
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.04	1.50	1.13	0.79	0.58	0.43	0.33	0.26	0.21
double	1.71	1.32	1.05	0.86	0.71	0.60	0.52	0.45	0.38
triple	2.07	1.60	1.28	1.05	0.87	0.74	0.63	0.55	0.48

**Table 07: AS24/1000W steel wall profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Top flange in compression Moment capacity 0.777 kNm/m Moment of inertia 5.229 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 0.823 kNm/m Moment of inertia 5.229 cm <sup>4</sup> /m		Support width 40mm	Web crushing 17.275 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.27	2.40	1.67	1.18	0.86	0.64	0.50	0.39	0.31
double	3.08	2.27	1.73	1.37	1.11	0.92	0.77	0.66	0.57
triple	3.85	2.83	2.17	1.71	1.39	1.15	0.96	0.82	0.71
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.08	2.27	1.67	1.18	0.86	0.64	0.50	0.39	0.31
double	2.92	2.24	1.77	1.43	1.18	0.97	0.82	0.70	0.60
triple	3.55	2.73	2.16	1.76	1.46	1.21	1.02	0.87	0.75

## PERFORMANCE

### AS30/1000R ROOF PROFILE



A deep profile roof sheet available in 0.5mm and 0.7mm thicknesses. The male underlapping sheet edge has a support leg and an anti-syphonic groove. A matching wall profile is available (see page 8 for load span tables).

**Table 08: AS30/1000R steel roof profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.682 kNm/m Moment of inertia 5.958 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.643 kNm/m Moment of inertia 5.943 cm <sup>4</sup> /m		Support width 40mm	Web crushing 5.112 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.74	2.02	1.55	1.24	1.01	0.84	0.71	0.61	0.52
double	2.58	1.91	1.47	1.17	0.95	0.79	0.67	0.58	0.50
triple	3.22	2.38	1.83	1.45	1.18	0.98	0.83	0.71	0.62
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.19	1.60	1.10	0.76	0.54	0.39	0.29	0.22	0.17
double	1.36	1.07	0.87	0.72	0.60	0.51	0.44	0.38	0.31
triple	1.62	1.29	1.05	0.87	0.73	0.62	0.52	0.40	0.31
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.34	2.44	1.85	1.45	1.16	0.95	0.79	0.66	0.56
double	2.07	1.64	1.32	1.09	0.91	0.77	0.66	0.57	0.50
triple	2.48	1.96	1.59	1.32	1.11	0.95	0.81	0.71	0.62

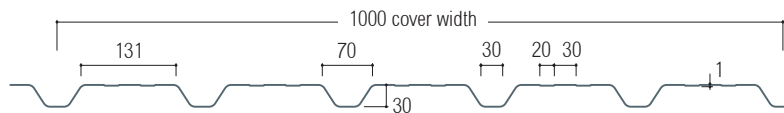
**Table 09: AS30/1000R steel roof profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 1.054 kNm/m Moment of inertia 9.056 cm <sup>4</sup> /m		Top flange in compression Moment capacity 1.11 kNm/m Moment of inertia 9.056 cm <sup>4</sup> /m		Support width 40mm	Web crushing 11.483 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.23	3.12	2.40	1.91	1.55	1.29	1.09	0.94	0.79
double	4.45	3.28	2.52	2.00	1.63	1.36	1.15	0.98	0.86
triple	5.55	4.09	3.14	2.49	2.03	1.68	1.42	1.22	1.06
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.80	2.53	1.68	1.16	0.83	0.60	0.45	0.34	0.26
double	2.54	1.97	1.58	1.29	1.07	0.90	0.77	0.61	0.48
triple	3.05	2.38	1.92	1.57	1.31	1.05	0.79	0.61	0.48
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	5.79	4.23	3.22	2.52	2.03	1.66	1.38	1.16	0.99
double	3.86	3.01	2.41	1.97	1.63	1.38	1.17	1.01	0.88
triple	4.65	3.63	2.92	2.39	2.00	1.69	1.45	1.25	1.09

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### AS30/1000W WALL PROFILE



A deep profiled wall sheet available in 0.5 and 0.7mm thicknesses. A matching roof profile is available (see page 7 for load span tables).

**Table 10: AS30/1000W steel wall profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Top flange in compression Moment capacity 0.682 kNm/m Moment of inertia 5.958 cm <sup>4</sup> /m	Bottom flange in compression Moment capacity 0.643 kNm/m Moment of inertia 5.943 cm <sup>4</sup> /m	Support width 40mm	Web crushing 5.112 kN/m	Young modulus 205 kN/mm <sup>2</sup>
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Wind suction	Deflection limit L/120								
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.55	1.87	1.44	1.13	0.92	0.73	0.56	0.44	0.36
double	2.71	1.99	1.52	1.20	0.97	0.81	0.68	0.58	0.50
triple	3.38	2.49	1.90	1.50	1.22	1.01	0.85	0.72	0.62

Wind pressure	Deflection limit L/120								
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.71	1.99	1.52	1.20	0.97	0.73	0.57	0.44	0.36
double	1.56	1.23	1.00	0.83	0.70	0.60	0.52	0.46	0.40
triple	1.85	1.47	1.20	1.00	0.85	0.73	0.63	0.55	0.49

**Table 11: AS30/1000W steel wall profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

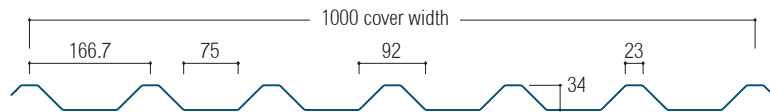
Top flange in compression Moment capacity 1.054 kNm/m Moment of inertia 9.056 cm <sup>4</sup> /m	Bottom flange in compression Moment capacity 1.11 kNm/m Moment of inertia 9.056 cm <sup>4</sup> /m	Support width 40mm	Web crushing 11.483 kN/m	Young modulus 205 kN/mm <sup>2</sup>
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Wind suction	Deflection limit L/120								
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.40	3.24	2.48	1.96	1.49	1.12	0.86	0.68	0.54
double	4.18	3.07	2.35	1.86	1.51	1.24	1.05	0.89	0.77
triple	5.23	3.84	2.94	2.32	1.88	1.56	1.31	1.11	0.96

Wind pressure	Deflection limit L/120								
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.18	3.07	2.35	1.86	1.49	1.12	0.86	0.68	0.54
double	3.05	2.39	1.93	1.59	1.34	1.14	0.98	0.85	0.75
triple	3.65	2.87	2.33	1.92	1.62	1.38	1.19	1.04	0.92

## PERFORMANCE

### AS34/1000R ROOF PROFILE



A deep profiled roof sheet available in 0.5 and 0.7mm thicknesses. The female overlapping sheet edge has an anti-siphonic groove. A matching wall profile is available (see page 10 for load span tables).

**Table 12: AS34/1000R steel roof profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.846 kNm/m Moment of inertia 6.425 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.945 kNm/m Moment of inertia 8.183 cm <sup>4</sup> /m		Support width 40mm	Web crushing 7.484 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.39	2.50	1.92	1.52	1.24	1.03	0.86	0.69	0.56
double	3.78	2.79	2.14	1.70	1.38	1.15	0.97	0.83	0.72
triple	4.72	3.48	2.67	2.12	1.72	1.43	1.20	1.03	0.89
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.24	2.30	1.53	1.06	0.76	0.56	0.42	0.32	0.25
double	1.85	1.45	1.17	0.96	0.80	0.68	0.58	0.51	0.44
triple	2.21	1.75	1.41	1.17	0.98	0.83	0.72	0.57	0.44
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.94	3.61	2.75	2.16	1.74	1.43	1.19	1.00	0.86
double	2.82	2.21	1.78	1.47	1.23	1.04	0.89	0.77	0.67
triple	3.37	2.66	2.15	1.78	1.49	1.27	1.09	0.95	0.83

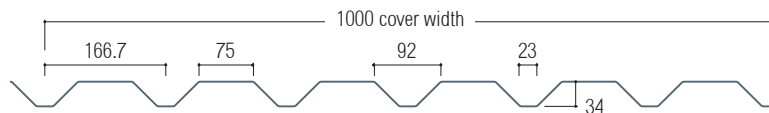
**Table 13: AS34/1000R steel roof profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 1.367 kNm/m Moment of inertia 10.471 cm <sup>4</sup> /m		Top flange in compression Moment capacity 1.539 kNm/m Moment of inertia 12.177 cm <sup>4</sup> /m		Support width 40mm	Web crushing 15.758 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	5.47	4.03	3.10	2.46	2.00	1.66	1.39	1.11	0.90
double	6.15	4.53	3.48	2.76	2.24	1.86	1.57	1.35	1.17
triple	7.68	5.65	4.34	3.44	2.79	2.32	1.95	1.67	1.45
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	5.29	3.43	2.28	1.58	1.13	0.84	0.63	0.48	0.37
double	3.39	2.63	2.11	1.72	1.43	1.21	1.03	0.84	0.66
triple	4.07	3.18	2.56	2.10	1.75	1.44	1.09	0.84	0.66
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	8.06	5.90	4.49	3.53	2.84	2.34	1.95	1.65	1.41
double	5.16	4.01	3.21	2.62	2.18	1.84	1.57	1.36	1.18
triple	6.21	4.85	3.90	3.20	2.67	2.26	1.94	1.67	1.46

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### AS34/1000W WALL PROFILE



A deep profiled wall sheet available in 0.5mm and 0.7mm thicknesses. A matching roof profile is available (see page 9 for load span tables).

**Table 14: AS34/1000W steel wall profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

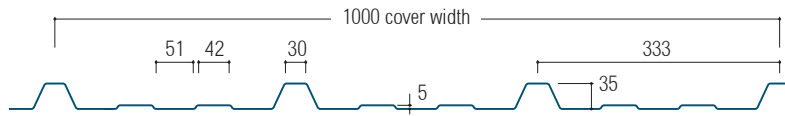
Top flange in compression Moment capacity 0.846 kNm/m Moment of inertia 6.425 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 0.945 kNm/m Moment of inertia 8.183 cm <sup>4</sup> /m		Support width 40mm	Web crushing 7.484 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.75	2.76	2.11	1.67	1.34	1.01	0.78	0.61	0.49
double	3.36	2.47	1.89	1.49	1.21	1.00	0.84	0.72	0.62
triple	4.20	3.08	2.36	1.87	1.51	1.25	1.05	0.89	0.77
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.36	2.47	1.89	1.45	1.05	0.79	0.61	0.48	0.38
double	2.28	1.81	1.47	1.22	1.03	0.89	0.77	0.67	0.59
triple	2.72	2.16	1.76	1.47	1.24	1.07	0.93	0.81	0.72

**Table 15: AS34/1000W steel wall profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Top flange in compression Moment capacity 1.367 kNm/m Moment of inertia 10.471 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 1.539 kNm/m Moment of inertia 12.177 cm <sup>4</sup> /m		Support width 40mm	Web crushing 15.758 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	6.11	4.49	3.44	2.71	2.00	1.50	1.16	0.91	0.73
double	5.42	3.99	3.05	2.41	1.95	1.61	1.36	1.16	1.00
triple	6.78	4.98	3.81	3.01	2.44	2.02	1.70	1.44	1.25
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	5.42	3.99	3.05	2.36	1.72	1.29	0.99	0.78	0.63
double	4.21	3.30	2.67	2.20	1.85	1.57	1.36	1.18	1.04
triple	5.03	3.97	3.21	2.66	2.23	1.91	1.65	1.44	1.27

## PERFORMANCE

### AS35/1000 ROOF PROFILE



A deep profile sheet which matches the AS35 insulated panel. Available in 0.5 and 0.7mm thicknesses. AS35/1000 can also be used as a wall profile (see page 12 for load span tables).

**Table 16: AS35/1000 steel roof profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.511 kNm/m Moment of inertia 5.256 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.479 kNm/m Moment of inertia 5.62 cm <sup>4</sup> /m		Support width 40mm	Web crushing 4.372 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.06	1.52	1.17	0.93	0.76	0.64	0.54	0.46	0.41
double	1.93	1.43	1.10	0.88	0.72	0.60	0.51	0.44	0.38
triple	2.41	1.78	1.37	1.09	0.89	0.74	0.63	0.54	0.47
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.62	1.18	0.90	0.70	0.51	0.37	0.27	0.21	0.16
double	1.08	0.85	0.68	0.56	0.46	0.39	0.33	0.29	0.25
triple	1.30	1.02	0.82	0.68	0.57	0.48	0.41	0.36	0.29
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.47	1.80	1.36	1.07	0.85	0.69	0.57	0.48	0.40
double	1.65	1.29	1.04	0.85	0.71	0.60	0.51	0.44	0.38
triple	1.98	1.56	1.26	1.03	0.86	0.73	0.63	0.54	0.47

**Table 17: AS35/1000 steel roof profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Bottom flange in compression Moment capacity 0.793 kNm/m Moment of inertia 8.373 cm <sup>4</sup> /m		Top flange in compression Moment capacity 0.832 kNm/m Moment of inertia 8.708 cm <sup>4</sup> /m		Support width 40mm	Web crushing 9.082 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	3.19	2.36	1.82	1.44	1.18	0.98	0.83	0.72	0.62
double	3.35	2.47	1.90	1.51	1.23	1.03	0.87	0.75	0.65
triple	4.17	3.08	2.37	1.88	1.53	1.27	1.08	0.93	0.80
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.83	2.07	1.57	1.11	0.79	0.58	0.43	0.33	0.25
double	1.94	1.50	1.20	0.97	0.81	0.68	0.57	0.49	0.43
triple	2.33	1.82	1.46	1.19	0.99	0.83	0.71	0.59	0.46
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.32	3.15	2.39	1.87	1.50	1.22	1.01	0.85	0.72
double	2.95	2.29	1.82	1.48	1.23	1.03	0.87	0.75	0.65
triple	3.55	2.77	2.22	1.81	1.51	1.27	1.08	0.93	0.81

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### AS35/1000 WALL PROFILE



A deep profile sheet which matches the AS35 insulated panel. Available in 0.5 and 0.7mm thicknesses. AS35/1000 can also be used as a roof profile (see page 11 for load span tables).

**Table 18: AS35/1000 steel wall profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

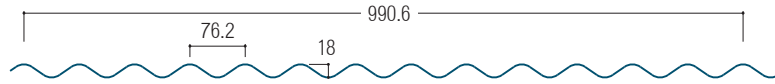
Top flange in compression		Bottom flange in compression				Support width	Web crushing	Young modulus		
Moment capacity 0.479 kNm/m		Moment capacity 0.511 kNm/m				40mm	4.372 kN/m	205 kN/mm <sup>2</sup>		
Moment of inertia 5.62 cm <sup>4</sup> /m		Moment of inertia 5.256 cm <sup>4</sup> /m								
Wind suction		Deflection limit L/120								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		2.03	1.49	1.14	0.90	0.73	0.60	0.50	0.39	0.31
double		1.90	1.40	1.07	0.84	0.68	0.57	0.48	0.40	0.35
triple		2.38	1.75	1.34	1.06	0.86	0.71	0.59	0.51	0.44
Wind pressure		Deflection limit L/120								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		1.90	1.40	1.07	0.84	0.68	0.57	0.48	0.40	0.34
double		1.28	1.01	0.82	0.68	0.58	0.49	0.43	0.37	0.33
triple		1.53	1.21	0.99	0.82	0.69	0.59	0.52	0.45	0.40

**Table 19: AS35/1000 steel wall profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Top flange in compression		Bottom flange in compression				Support width	Web crushing	Young modulus		
Moment capacity 0.832 kNm/m		Moment capacity 0.793 kNm/m				40mm	9.082 kN/m	205 kN/mm <sup>2</sup>		
Moment of inertia 8.708 cm <sup>4</sup> /m		Moment of inertia 8.373 cm <sup>4</sup> /m								
Wind suction		Deflection limit L/120								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		3.15	2.31	1.77	1.40	1.13	0.94	0.79	0.63	0.50
double		3.30	2.43	1.86	1.47	1.19	0.98	0.83	0.70	0.61
triple		4.13	3.03	2.32	1.83	1.49	1.23	1.03	0.88	0.76
Wind pressure		Deflection limit L/120								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		3.30	2.43	1.86	1.47	1.19	0.98	0.83	0.65	0.52
double		2.28	1.78	1.43	1.18	0.99	0.84	0.72	0.63	0.55
triple		2.73	2.14	1.73	1.42	1.20	1.02	0.88	0.76	0.67

## PERFORMANCE

### AS13/3/990 ROOF PROFILE



A shallow corrugated profile sheet available in 0.5mm and 0.7mm thicknesses. AS13/3/990 can also be used as a wall profile (see page 14 for load span tables).

**Table 20: AS13/3/990 steel roof profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

Bottom flange in compression		Top flange in compression				Support width	Web crushing	Young modulus	
Moment capacity 0.542 kNm/m		Moment capacity 0.542 kNm/m				40mm	7.734 kN/m	205 kN/mm <sup>2</sup>	
Moment of inertia 1.782 cm <sup>4</sup> /m		Moment of inertia 1.782 cm <sup>4</sup> /m							
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.85	1.18	0.81	0.58	0.44	0.34	0.27	0.22	0.19
double	2.18	1.61	1.24	0.99	0.81	0.67	0.57	0.47	0.39
triple	2.72	2.01	1.54	1.23	0.98	0.75	0.59	0.47	0.39
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	0.77	0.47	0.30	0.19	0.13	0.09	0.06	0.03	0.02
double	1.31	0.81	0.53	0.36	0.25	0.17	0.12	0.09	0.06
triple	1.31	0.81	0.53	0.36	0.25	0.17	0.12	0.09	0.06
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.81	2.05	1.55	1.21	0.97	0.79	0.66	0.55	0.47
double	2.20	1.69	1.34	1.09	0.89	0.75	0.63	0.54	0.47
triple	2.67	2.06	1.64	1.33	1.10	0.93	0.79	0.68	0.58

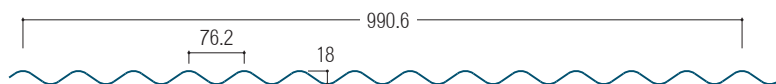
**Table 21: AS13/3/990 steel roof profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Bottom flange in compression		Top flange in compression				Support width	Web crushing	Young modulus	
Moment capacity 0.798 kNm/m		Moment capacity 0.798 kNm/m				40mm	20.551 kN/m	205 kN/mm <sup>2</sup>	
Moment of inertia 2.652 cm <sup>4</sup> /m		Moment of inertia 2.652 cm <sup>4</sup> /m							
Wind suction		Deflection limit L/90							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.75	1.76	1.20	0.86	0.64	0.50	0.40	0.33	0.28
double	3.21	2.37	1.83	1.45	1.19	0.99	0.84	0.70	0.57
triple	4.00	2.95	2.27	1.81	1.46	1.11	0.87	0.70	0.57
Imposed load		Deflection limit L/200							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.14	0.70	0.44	0.29	0.20	0.13	0.09	0.05	0.03
double	1.95	1.20	0.78	0.53	0.37	0.26	0.19	0.13	0.09
triple	1.95	1.20	0.78	0.53	0.37	0.26	0.19	0.13	0.09
Drifting snow load									
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	4.14	3.02	2.29	1.79	1.43	1.17	0.97	0.81	0.69
double	3.90	2.95	2.29	1.79	1.43	1.17	0.97	0.81	0.69
triple	4.78	3.63	2.84	2.26	1.81	1.48	1.23	1.04	0.88

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### AS13/3/990 WALL PROFILE



A shallow corrugated profile sheet available in 0.5mm and 0.7mm thicknesses. AS13/3/990 can also be used as a roof profile (see page 13 for load span tables).

**Table 22: AS13/3/990 steel wall profile • Thickness 0.5mm • Weight 4.57 kg/m<sup>2</sup>**

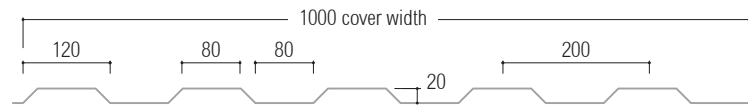
Top flange in compression Moment capacity 0.542 kNm/m Moment of inertia 1.782 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 0.542 kNm/m Moment of inertia 1.782 cm <sup>4</sup> /m		Support width 40mm	Web crushing 7.734 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.35	0.85	0.57	0.40	0.29	0.22	0.17	0.13	0.11
double	2.15	1.58	1.21	0.96	0.70	0.53	0.41	0.32	0.26
triple	2.69	1.98	1.37	0.97	0.70	0.53	0.41	0.32	0.26
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	1.35	0.85	0.57	0.40	0.29	0.22	0.17	0.13	0.11
double	1.70	1.32	1.05	0.86	0.70	0.53	0.41	0.32	0.26
triple	2.05	1.59	1.28	0.97	0.70	0.53	0.41	0.32	0.26

**Table 23: AS13/3/990 steel wall profile • Thickness 0.7mm • Weight 6.49 kg/m<sup>2</sup>**

Top flange in compression Moment capacity 0.798 kNm/m Moment of inertia 2.652 cm <sup>4</sup> /m		Bottom flange in compression Moment capacity 0.798 kNm/m Moment of inertia 2.652 cm <sup>4</sup> /m		Support width 40mm	Web crushing 20.551 kN/m	Young modulus 205 kN/mm <sup>2</sup>			
Wind suction		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.01	1.27	0.85	0.60	0.43	0.33	0.25	0.20	0.16
double	3.17	2.33	1.78	1.41	1.05	0.79	0.61	0.48	0.38
triple	3.96	2.91	2.05	1.44	1.05	0.79	0.61	0.48	0.38
Wind pressure		Deflection limit L/120							
Span	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single	2.01	1.27	0.85	0.60	0.43	0.33	0.25	0.20	0.16
double	2.99	2.28	1.78	1.41	1.05	0.79	0.61	0.48	0.38
triple	3.65	2.79	2.05	1.44	1.05	0.79	0.61	0.48	0.38

## PERFORMANCE

### AS20/1000 LINER PROFILE



A shallow profiled liner sheet 0.4mm and 0.7mm thick. The AS30/1000R profile can also be used as a liner sheet where a more rigid roof lining is required.

**Table 24: AS20/1000 steel liner profile • Thickness 0.7mm • Weight 5.75 kg/m<sup>2</sup>**

Bottom flange in compression		Top flange in compression				Support width		Web crushing	Young modulus	
Moment capacity 0.683 kNm/m		Moment capacity 0.683 kNm/m				65mm		15.386 kN/m	205 kN/mm <sup>2</sup>	
Moment of inertia 4.195 cm <sup>4</sup> /m		Moment of inertia 4.195 cm <sup>4</sup> /m								
Wind suction		Deflection limit L/90								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		2.75	2.03	1.57	1.25	0.97	0.75	0.59	0.48	0.39
double		2.75	2.03	1.57	1.25	1.02	0.85	0.72	0.62	0.54
triple		3.43	2.53	1.95	1.55	1.26	1.05	0.89	0.76	0.66
Imposed load		Deflection limit L/200								
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		1.85	1.15	0.75	0.51	0.36	0.25	0.18	0.13	0.09
double		2.11	1.60	1.26	0.89	0.63	0.46	0.34	0.26	0.19
triple		2.58	1.95	1.29	0.89	0.63	0.46	0.34	0.26	0.19
Drifting snow load										
Span		1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
single		3.54	2.58	1.96	1.53	1.22	1.00	0.83	0.69	0.59
double		3.22	2.44	1.91	1.53	1.22	1.00	0.83	0.69	0.59
triple		3.94	3.00	2.36	1.90	1.55	1.27	1.05	0.89	0.75

### Fragility

When 0.7mm thick AS20 or AS30 liner sheets are installed to Steadmans' recommendations - using correctly located fixings with 16mm bonded washers, 4mm diameter NFRC class A butyl sealant at the end laps and 50mm x 1mm Polyband air seal / moisture barrier tape at the side laps - the roof is classified as a class B non-fragile assembly, as defined in the ACR(M)001:2005 'Test for non-fragility of profiles sheeted roofing assemblies' (third edition).

When 0.7mm thick external sheet profiles are installed to Steadmans' recommendations - using correctly located fixings with 16mm bonded washers and 6mm x 5mm NFRC class A butyl sealant at the end and side laps - the roof is classified as a class B non-fragile assembly, as defined in the ACR(M)001:2005 'Test for non-fragility of profiles sheeted roofing assemblies' (third edition).

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### Durability

The profiles have a predicted service life of 40 years. Time to first maintenance depends upon the finish and the environmental conditions but can be as high as 30 years. Coatings will degrade more rapidly in industrial or coastal air conditions and darker finishes will fade more rapidly than light ones. Table 25 gives the time to first repainting for profiles finished with standard Plastisol colours.

Service life can be increased by treating site cut edges with site applied touch up paint at the time of cutting and by following the guidance on inspection and maintenance on page 45.

**Table 25: Life to first full repainting for plastisol coated profiles**

Colours	Wall profiles		Roof profiles		Table based on data from Dobel. Steel from other producers may have different durability values.
	Inland	Coastal*	Inland	Coastal*	
Group 1	30	25	25	20	
Group 2	25	20	20	15	

\*within 1.5 miles from lake or sea shoreline

Group 1: Bamboo, Buttermilk, Goosewing Grey, Ivory, Merlin Grey, Moorland Green, Mushroom, New Grey, Olive Green, Pigeon Grey, Wedgwood Blue, White, Willow.

Group 2: Black, Cornflower Blue, Country Green, Golden Glow, Golden Yellow, Forest Green, Jade, Juniper Green, Linden Green, New Red, Ocean Blue, Pacific Blue, Poppy Red, Saffron, Sage Green, Slate Blue, Tangerine Orange, Terracotta, Vandyke Brown.

### Fire

When tested to BS 476-7:1997 AS roof and wall profiles achieve Class 1 surface spread of flame (Euroclass B), equivalent to Class 0 surface spread of flame as described in Approved Document B. When tested to BS 476-3:2004 the profiles achieve an FAA/SAA rating.

### Biological

The profiles are unaffected by mould, fungi and mildew. They do not support vermin.

### Colours

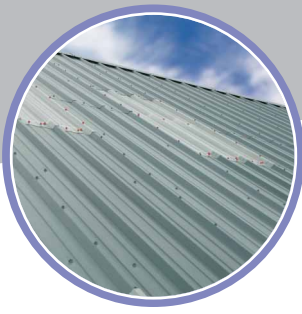
Table 26 shows available standard profile colours. Special colours are also available, contact Steadmans for more details.

The colours below include the nearest British Standard reference for guidance only as the colours vary slightly from British Standard. Due to limitations in printing, colours are for guidance only - specification should be made from an actual sample, available from Steadmans.

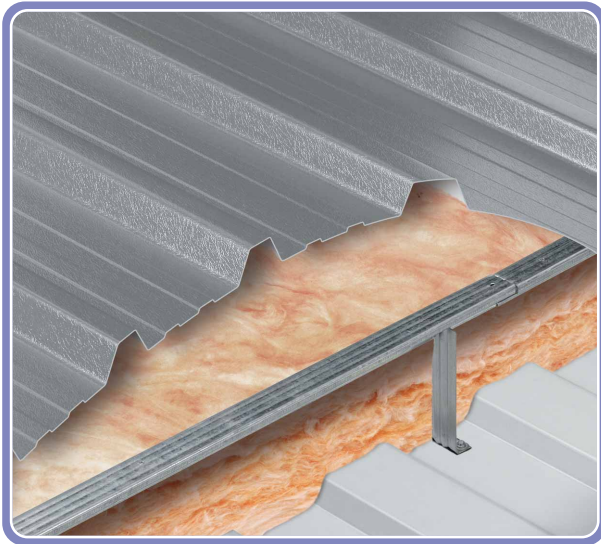
**Table 26: Standard profile colours**

			
Goosewing Grey* 10A05	Ivory RAL9002	Merlin Grey* 18B25	Moorland Green 12B21
			
Mushroom 10B19	Olive Green 12B27	Juniper Green* 12B29	Ocean Blue 18C39
			
Slate Blue* 18B29	Terracotta* 04C39	Vandyke Brown* 08B29	White 00E55

\*Also available in Polyester coated finish



## ACCESSORIES



### Fixings

Steadmans supply a bar and bracket spacer system for installing the liner and weather sheet, as well as a full range of fixings.

### Insulation

Mineral or glass wool insulation can be used to provide appropriate thermal and acoustic performance.

### Gutters

Steadmans manufacture and supply a range of gutters to match the profiles.

Gutters are produced from a variety of materials including pre-galvanised steel (to BS EN 10143:2006) and pre-coated steel, either painted or PVC-coated on one or both sides; aluminium can be supplied to order. Complete gutter systems and accessories can be manufactured to specification, up to 10m long and 3mm thick: contact Steadmans' sales office for details of sizing.

### Rooflights

Steadmans offer a range of site assembled in-plane rooflights to match the dimensions of AS twin skin profiles (see table 27). Triple skin site assembled rooflights are available for projects where U-values of 2.2W/m<sup>2</sup>K\* are required: they consist of two skins of GRP, which are installed with the liner and weather sheets, and an intermediate insulating layer of polycarbonate. Double skin rooflights may be used on projects where higher U-values are acceptable.

Rooflights can be supplied to meet project requirements for light transmission, durability, non-fragility rating and fire resistance: contact Steadmans' sales office for details.

**Table 27: Rooflights**

Property	Units	Value
Minimum slope	°	6
Maximum length	m	7
Width (centre-centre)	mm	1000
U-value	W/m <sup>2</sup> K	2.2*

\* Figures supplied by Brett Martin Daylight Systems Ltd.  
Other manufacturer's figures may vary.

### Flashings

Steadmans manufacture a range of flashings to match the profiles in Plastisol leathergrain, polyester, Nova, Scintilla, galvanised, or PVDF finishes. Flashings can be supplied in lengths up to 6m in traditional profiles, or can be shaped to meet special customer requirements.

### Sealants

Steadmans supply a range of NFRC Class A butyl sealants, profile foam fillers and expanding foams to enable profiles to be sealed to each other and to other building components, so avoiding thermal bridging and air leakage.

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN GUIDANCE

#### Structure

AS twin skin systems are designed to be supported by steel or timber purlins: liners are supported by and fixed directly to the purlins, whilst weather sheets are supported by and fixed to rails which are held off the purlins by a spacer system. Roof profiles are usually laid with the broad valley resting on the purlin or spacer bar: wall profiles will usually have the narrow valley against the purlin or spacer bar. All 0.7mm thick trapezoidal profiles are suitable for spanning purlins at 1.8m centres. Consult Steadmans' Technical Department for guidance on using the profiles on purlins at centres greater than 1.8m. Steelwork for twin skin systems should be within the tolerances given in BS 5950-2:2001: fixing planes on adjacent purlins should be less than  $L/600$  apart (where L is the purlin spacing). AS sheets should be isolated from preservative treated timber purlins by PVC barrier tape applied to the bearing face of the purlins.

#### Fixings

Fixings for roof profiles provide restraint against wind uplift forces; those for wall profiles provide restraint and support. Whilst profiles may be fixed through valleys or crowns, Steadmans recommend valley fixing: accurate fixing is easier to achieve, loads on the fixings are smaller, the fixings are less likely to distort the profile, and better compression of the sealant is achieved at end laps.

Fixings should be stainless steel or carbon-steel self drilling screws: those for the weather sheet should have press-on or integral caps to match the colour of the profile and should have a 16mm diameter EDPM washer to prevent water penetration.

Fixings to light and heavy section steel should pass through the steel and leave 5mm of thread exposed on the underside of the section. Fixing to timber must achieve a minimum 40mm embedment.

#### AS30 roof profile & AS20 liner profile

standard fixing position



lapped joint fixing position



eaves fixing position



#### AS24 & AS34 roof profiles

standard fixing position



lapped joint fixing position



eaves fixing position



#### AS30 wall profile & AS liner profile

standard fixing position



lapped joint fixing position



#### AS24 & AS34 wall profiles

standard fixing position



lapped joint fixing position



**Figure 01: Fixing positions for roof and wall profiles - to achieve optimum sealant compression**

AS TWIN SKIN SYSTEMS

## DESIGN GUIDANCE

### Fixings continued

The 0.4mm thick liner sheets should be restrained by support bar brackets, which are set at 1m centres on each purlin. Washered fixing screws may be used to provide temporary restraint during installation. The 0.7mm thick liner sheets should be fixed as shown on page 18.

Weather sheets should be fixed directly to the support bars. Each weather sheet requires three fixings (in alternate valleys) at intermediate purlins, four fixings at the eaves and one fixing in each valley at laps. Consult Steadmans' Technical Department for guidance on fixing sheets in extreme exposure conditions.

AS13/3/990 corrugated profiles should be fixed through the crowns of the corrugations. Profiles should be fixed at every second crown at each end (including laps), and at every third crown over intermediate purlins: stagger the fixing pattern across multiple intermediate purlins (there must be a fixing in each side lap).

### Laps

Side laps between sheets are formed by lapping the female side of one sheet over the male crown of the adjacent sheet. The exposed edge of the lap should face away from the prevailing wind.

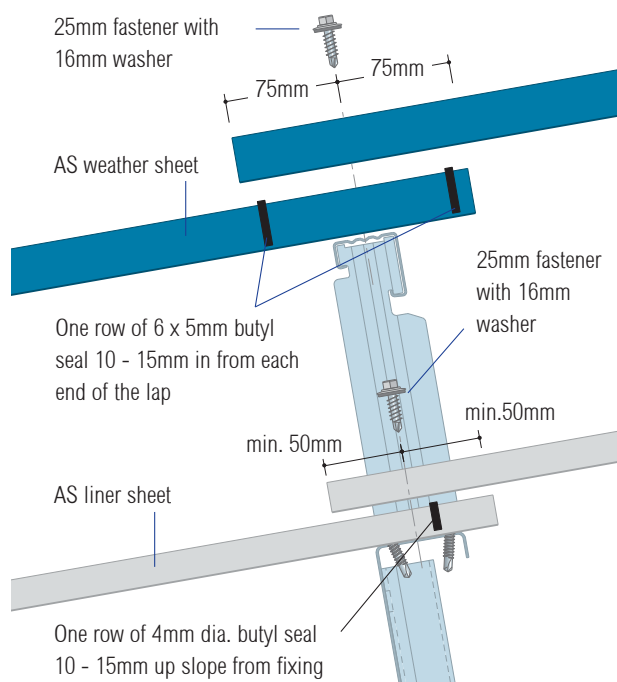
Side laps of liner sheets should be sealed with polyband plastic backed butyl sealant strip 50mm wide by 1mm high. Side laps of weather sheets should be sealed with butyl sealant strip 6mm wide by 5mm high. Weather sheet side laps on roofs should be stitched with 23mm long self drilling screws at 450mm centres.

End laps are required in roofs with two or more tiers of sheets. End laps are formed by lapping the upper weather sheet 150mm over the lower sheet. End laps of liner sheets should be sealed with a run of 4mm butyl bead sealant applied 10 - 15mm up slope of the fixing line and fixed with 25mm fasteners.

End laps of weather sheets should be sealed with two runs of butyl sealant strip 6mm wide by 5mm high applied 10 - 15mm from each end of the lap and fixed with 25mm fasteners.

**Note:** at end laps all metal and GRP weather and liner sheets should extend a minimum of 50mm beyond the fixing line (see figure 02).

Side laps between rooflight inner sheets and liner sheets should be sealed with polyband plastic backed butyl sealant strip 50mm wide by 1mm high. End laps should be sealed with a run of 4mm bead sealant 10 - 15mm above the fixing line. Side laps between rooflight outer sheets and AS weather sheets should be sealed with 6mm wide by 5mm high butyl sealant and stitched with 23mm self drilling fixings or laplocks (see figure 36). End laps should be sealed with two runs of 8mm diameter butyl sealant applied 10 - 15mm from each end of the lap.



**Figure 02: End lap fixing details - roof profiles**

(Note: insulation omitted for clarity)

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN GUIDANCE

#### Laps continued

Where four sheets overlap additional runs of butyl sealant are required between the male and female crowns of all four sheets to prevent air leakage.

The inner and outer sheets of rooflights can be lapped over the metal sheets on both sides to facilitate fixing. Junctions between rooflights and profiles should be protected with flashings or foam fillers to prevent thermal insulation intruding onto rooflights.

#### Fire

AS20/1000 and AS30/1000 profiles used as internal liners provide class O resistance to surface spread of flame and can be used to form roof and wall linings without any additional treatment. All AS series weather sheets achieve an AA rating against external spread of flame and may be used on any location on the roof.

The AS Fire Resistant Wall System, which includes two 80mm layers of Rockwool Firesafe insulation, achieves 125 minutes integrity and 35 minutes insulation when tested to BS 476-22:1987 (Warrington Fire Safety test report 150032 Issue 2). Full specification details of the Fire Resistant Wall System are available from Steadmans Technical Department.

In England & Wales and Northern Ireland a standard AS twin skin system may be used on walls more than 1m from a boundary: see Approved Document B section 13 (England & Wales) and Technical Booklet E (N. Ireland) for details of boundary conditions. Walls within 1m of a boundary should be constructed with the AS Fire Resistant Wall System.

In Scotland the AS Fire Resistant Wall system should be used for all walls which require a fire resistance period. See Scottish Building Standards Technical Handbook Section 2 for details of boundary conditions and fire resistance requirements.

#### Thermal performance

Carbon emissions from non-domestic buildings must now be an aggregate 25% lower than those predicted for a comparable building which would have met the requirements of Part L 2006. Energy use and emissions must be calculated using the Simplified Building Energy Model (SBEM), either by using iSBEM (a free software tool available from the DCLG) or by using an accredited simulation tool. Whilst designers will now have to consider building form, efficiency of services and the use of low or zero carbon energy generation they will still have to address fabric heat losses:

**Conduction losses:** although fabric U-values are no longer recognised as a means of demonstrating compliance with Part L they still have a substantial effect upon overall rates of carbon emission. The U-value achieved by a twin skin system depends on the depth of insulation specified (see Table 28 on page 21).

**Thermal bridging:** SBEM takes account of heat losses at junctions between building elements by means of their linear thermal transmittance values (psi values). Psi values for junctions and perimeters in the twin skin systems are shown in table 29 on page 21.

**Air leakage:** whilst the regulations for England and Wales and N. Ireland set an air leakage limit of  $10\text{m}^3/\text{m}^2/\text{hr}$  @ 50Pa ( $15\text{m}^3/\text{m}^2/\text{hr}$  for Scotland), designers may choose to base their SBEM calculations upon lower rates. When correctly detailed and installed a twin skin system will contribute to achieving a low air leakage rate.

Work which involves increasing the capacity of building services in existing buildings (described in Approved Document L2B) may require improvements to the thermal performance of building elements. One means of achieving that would be to replace existing roof or wall profiles with a twin skin system.

## DESIGN GUIDANCE

**Table 28: Roof and Wall U-values for twin skin systems**

U-value (W/m <sup>2</sup> K)	Insulation thickness (mm)	U-values based on the use of mineral wool insulation with a thermal conductivity of 0.04W/mK
0.35	130	
0.30	150	
0.25	180	
0.20	220	
0.16	280	

The calculations have been carried out in accordance with the recommendations of MCRMA Technical Paper 14 'Guidance for the design of metal roofing and cladding to comply with approved document L2:2001', using finite element analysis computer program HEAT2. This program is fully compatible with BS EN ISO 10211-1:1996 'Thermal bridges in building construction. Heat flows and surface temperatures - General calculation methods' and so meets the requirements of Approved Document L.

**Table 29: Psi & f-values for profile junctions and perimeters**

Junction	Psi value (W/mK)	f-value
Eaves (fig 03)	0.03	0.95
Verge (fig 09)	0.03	0.95
Ridge (fig 07)	0.02	0.96
Parapet (fig 17)	-0.11	0.83
Parapet gutter (fig 15)	0.69	0.49
Valley gutter* (fig 13)	1.26	0.73
Wall - ext corner (fig 29)	0.02	0.94
Wall - int corner (fig 28)	-0.06	0.96
Wall - drip (fig 27)	0.33	0.74
Door/window head (fig 33)	0.50	0.58
Door/window jamb (fig 32)	0.49	0.59
Window sill (fig (fig 34)	0.50	0.60
Industrial door head	0.43	0.74
Industrial door jamb	0.42	0.74

\* use twice the value for a full gutter  
Note that values are only applicable to the components on the detail.  
Changes to the detail will alter values

### Control of condensation

Part C2 of the Building Regulation requires designers to prevent harmful condensation forming on or within building elements. To minimise the risk of condensation designers should arrange for the extraction at source of moisture generated by activities and processes within the building and adopt forms of construction which will not trap moisture within building elements. Designers should observe the guidance in BS 5250:2002.

A twin skin system is unlikely to be affected by surface condensation as the insulation will keep the temperature of the liner sheet above dew point. Designers should assess the risk of surface condensation at linear thermal bridges using the method in BRE IP 17/01 and the temperature factors (f-values) shown in table 29.

The high vapour resistance of the liner sheet and the correct application of butyl seal at liner sheet junctions will inhibit interstitial condensation. Designers should assess the risk of interstitial condensation using the method in BS EN 13788:2002 and the guidance in BS 5250:2002.

### Drainage

AS twin skin systems are intended for roofs with a minimum slope of 4°; if the roof includes rooflights the minimum slope is 6°. Gutters and downpipes should be designed to collect rain and snow falling on the roof and discharge it safely. Drainage capacity should be determined according to BS EN 12056-3:2000.

The U-value of a factory formed insulated gutter should be slightly higher than that of the twin skin roof to ensure snow and ice melts first in the gutter.

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN GUIDANCE

#### Rooflights

**Illuminance:** the area of rooflights required to illuminate the building interior depends upon the type of activities taking place. BS 8206-2:2008 Code of practice for daylighting gives guidance. Table 30 shows how to achieve the recommended levels.

**Thermal performance:** with the adoption of the whole building compliance method in Part L there is no maximum permitted area for rooflights: designers must assess the performance of rooflights as part of the SBEM evaluation. The only limits on rooflights are that no rooflight may have a U-value worse than 3.3W/m<sup>2</sup>K and the area weighted U-value of all rooflights must not exceed 2.2W/m<sup>2</sup>K: triple skin site assembled rooflights can be supplied to meet those limits.

**Solar gain:** Part L requires designers to ensure solar gains in summer will not be excessive. TM37 contains guidance and calculation methods.

**Safety:** rooflights must provide safety levels appropriate to the frequency of roof access. All Steadmans rooflights offer a non-fragility rating of class B on installation. However, for standard 2.4kg gauge rooflights that level of non-fragility may not be maintained over their 25 year service life. Where rooflights must be non-fragile throughout their service life Steadmans recommend the use of 3.0kg gauge rooflights. Consult Steadmans for further guidance.

**Table 30: Rooflight areas**

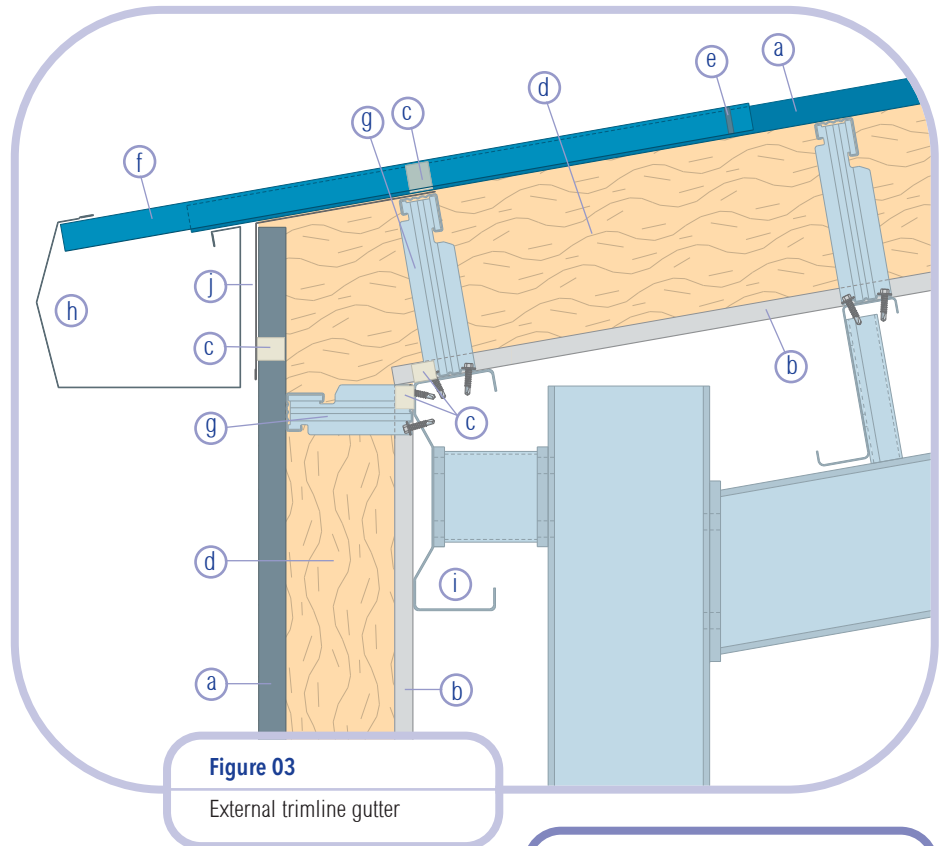
Characteristics of activity / interior	Level of illuminance req. (lux)	Recommended min. rooflight area (% of floor area)
Interiors used occasionally, with visual tasks confined to movement and limited perception of detail e.g. bulk stores	100	10%
Continuously occupied interiors, with visual tasks not requiring perception of detail e.g. loading bays, plant rooms	200	10%
Moderately difficult visual tasks, colour judgement may be required e.g. sports and assembly halls, packing, general offices, engine assembly, retail shops	300 - 500	13% - 15%
Difficult visual tasks, accurate colour judgement required e.g. drawing offices, inspection, electronic assembly	750 - 1000	17% - 20%

\*Table based on research by Institute of Energy and Sustainable Development, De Montford University for illuminance in the horizontal plane - rooflight area should be greater where illumination is needed in the vertical plane e.g. where vertical racking is used.

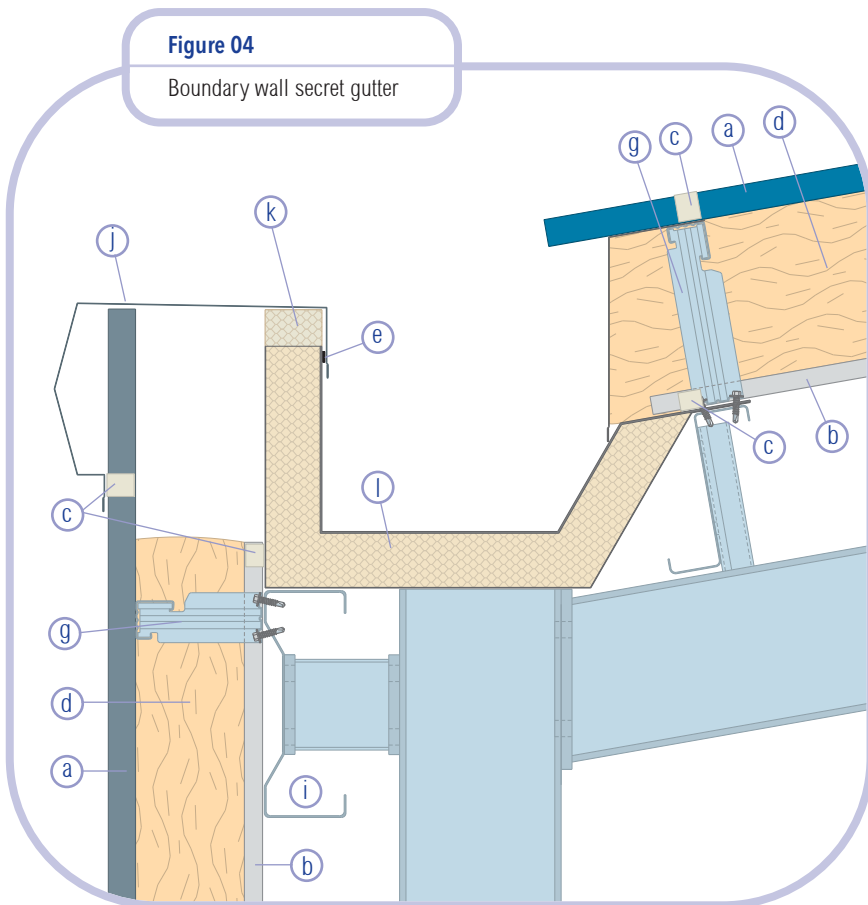
\*\* Figures for the level of illuminance required are taken from CIBSE Guide A (table 1.12)

## DESIGN DETAILS

This section sets out common details for the AS twin skin system. All the details here are available in CAD format from the Steadmans web site.



**Figure 04**  
Boundary wall secret gutter



### Key to figures 03 & 04

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Seal - 6 x 5mm butyl rubber
- f** Gutter support arm stitched to weather sheet @ max. 200mm centres
- g** Bar and bracket system
- h** Plastisol external eaves gutter
- i** Eaves beam
- j** Flashing with 150mm min. sealed lap joints
- k** PIR insulation board
- l** Insulated gutter

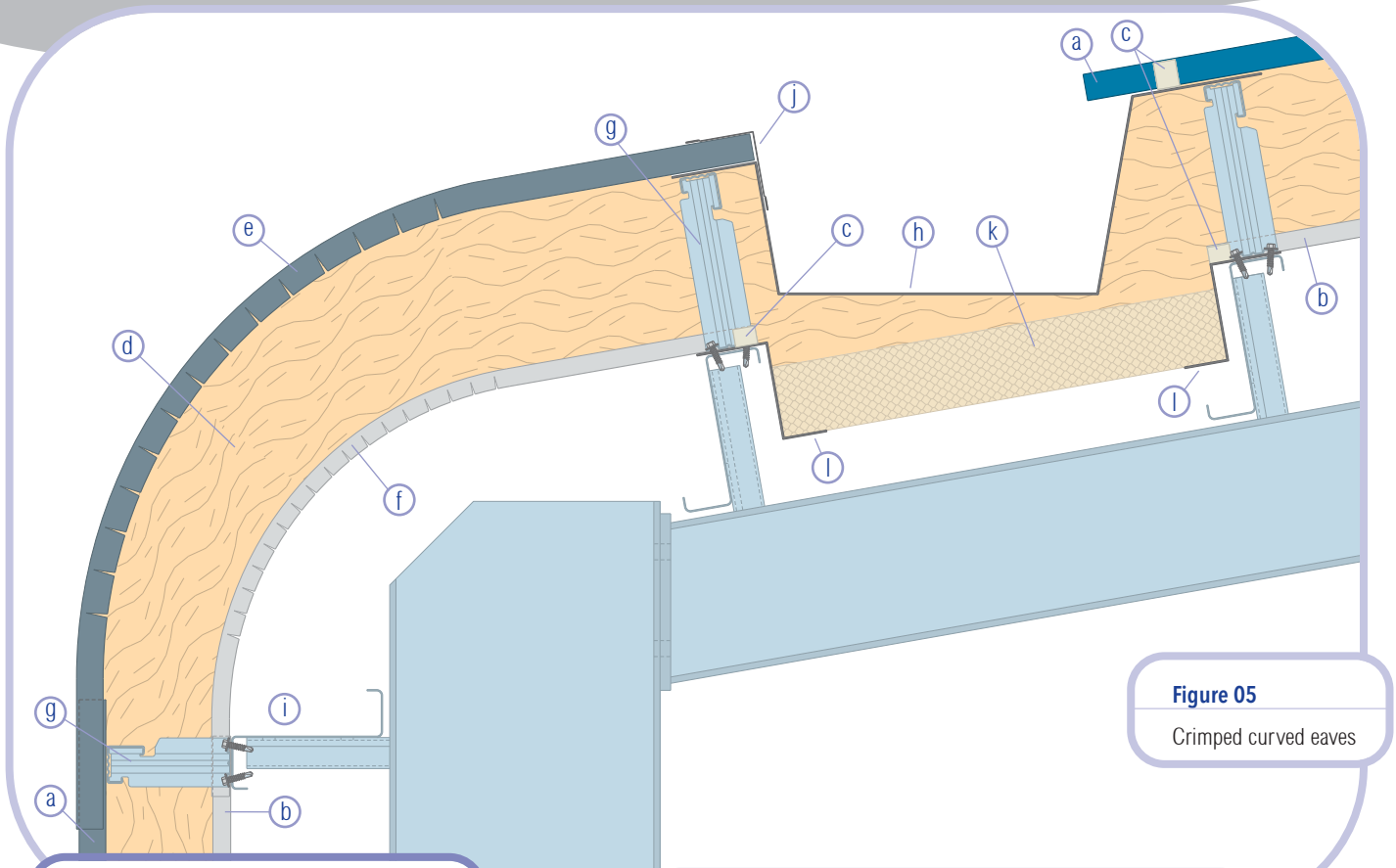
### Notes

- Factory formed insulated gutter:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS



**Figure 05**

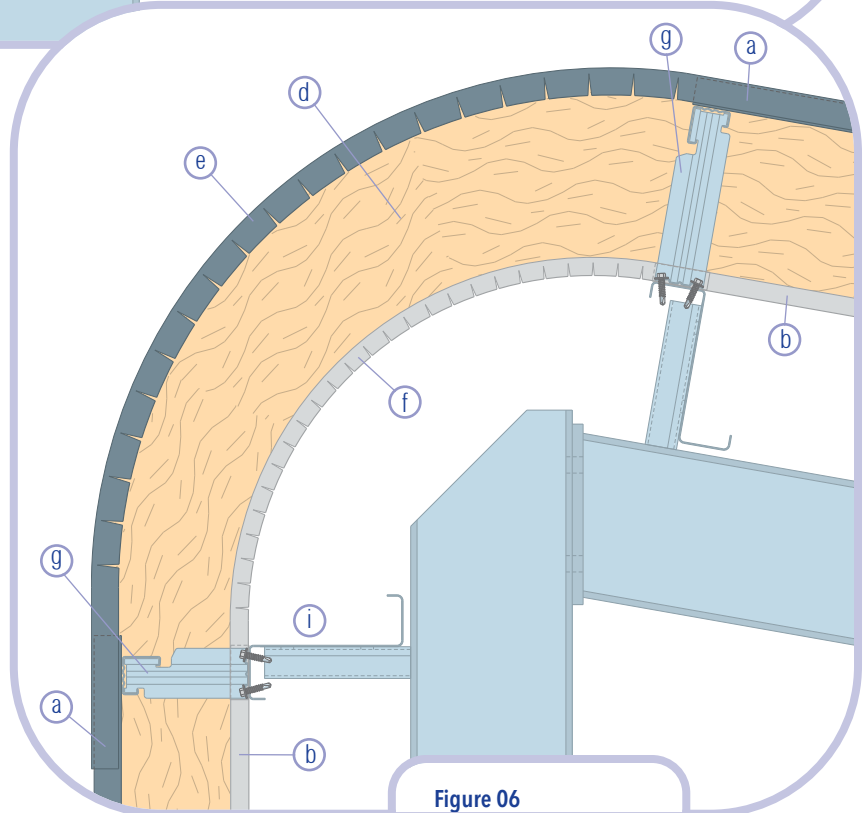
Crimped curved eaves

#### Key to figures 05 & 06

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Curved weather sheet (crimped)
- f** Curved liner sheet (crimped)
- g** Bar and bracket system
- h** Gutter
- i** Side rail
- j** Gutter flashing
- k** PIR board insulation on galvanised supports sealed with 50 x 1mm polyband tape
- l** Galvanised insulation support

#### Notes

- PIR board insulation:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K
- 450mm min outside radius of curved sheets

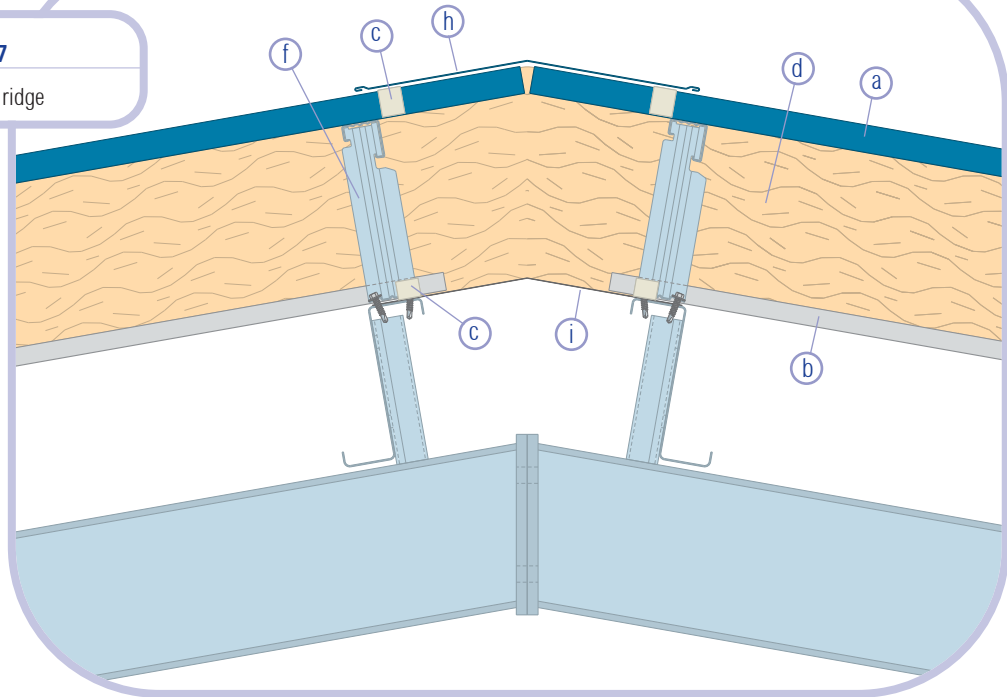


**Figure 06**

Crimped curved ridge

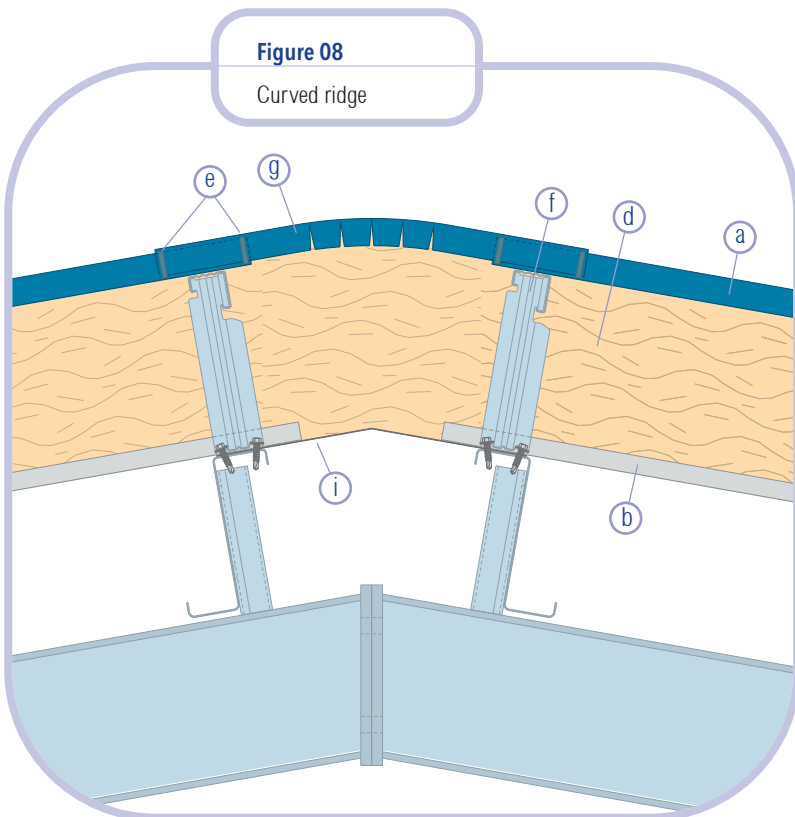
**Figure 07**

Standard ridge



**Figure 08**

Curved ridge



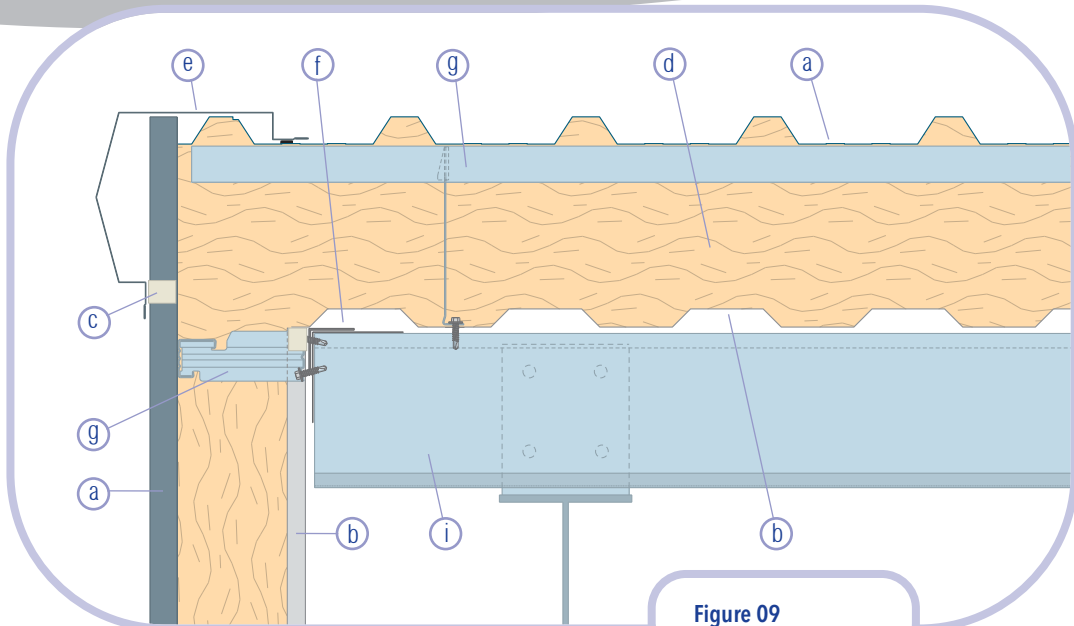
**Key to figures 07 & 08**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Seal - 6 x 5mm butyl rubber
- f** Bar and bracket system
- g** Curved ridge sheet (crimped)
- h** Ridge flashing with min. 150mm sealed lap joints
- i** Internal liner flashing with min 75mm sealed lap joints

# TWIN SKIN SYSTEMS

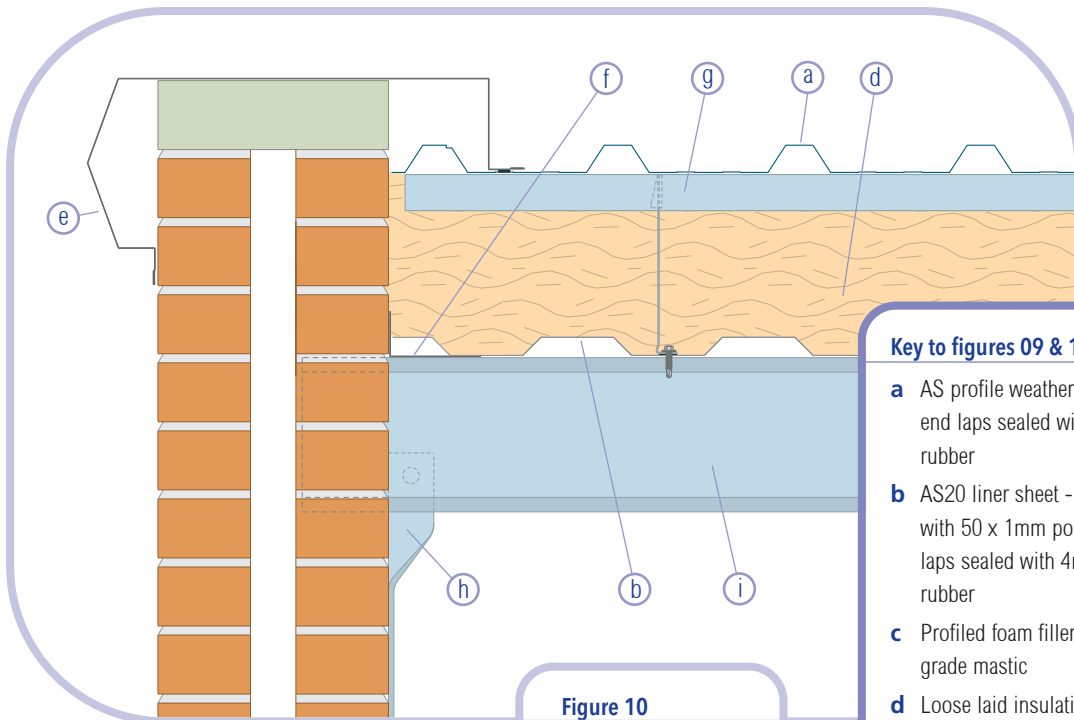
## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS



**Figure 09**

Verge to wall cladding



**Figure 10**

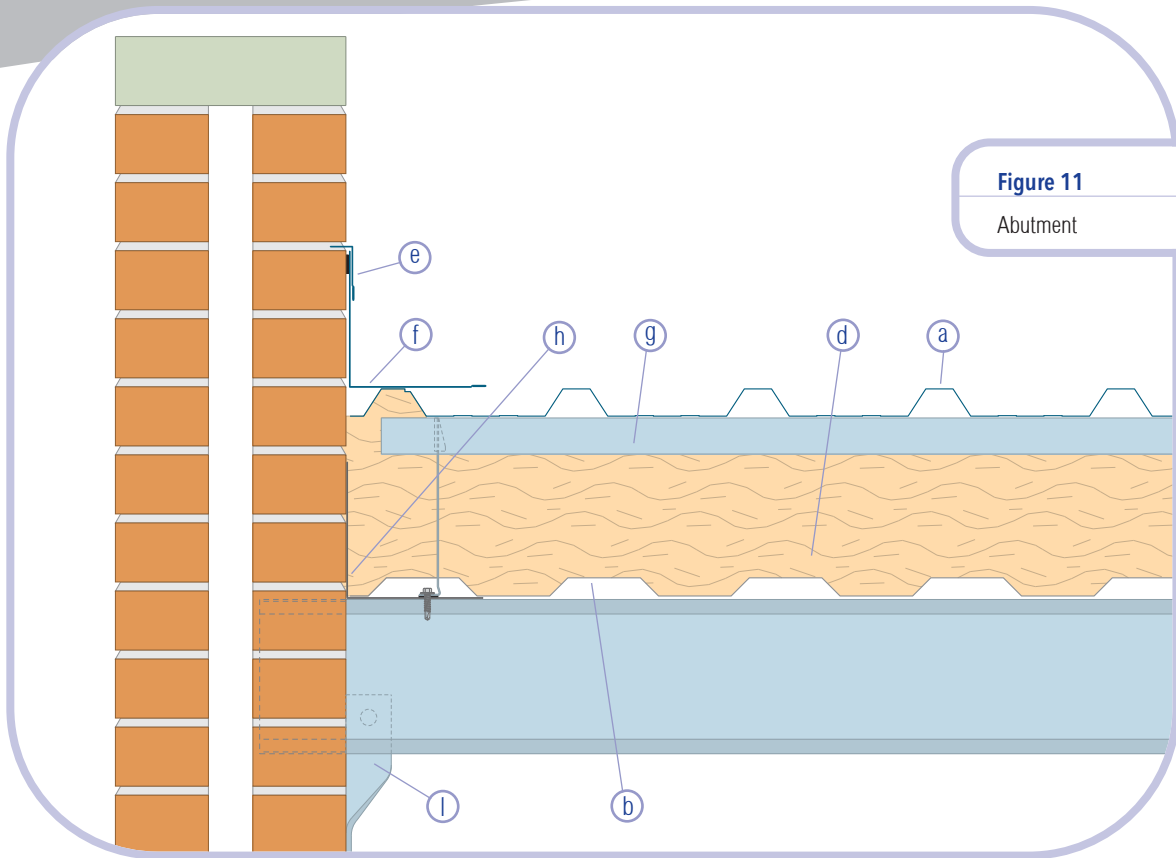
Verge to brick wall

#### Key to figures 09 & 10

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Barge flashing with min. 150mm sealed lap joints
- f** Internal corner flashing with min. 75mm sealed lap joints
- g** Bar and bracket system
- h** Wall strap (if required)
- i** Purlin

#### Notes

- Designers must ensure that walls have an appropriate thermal performance

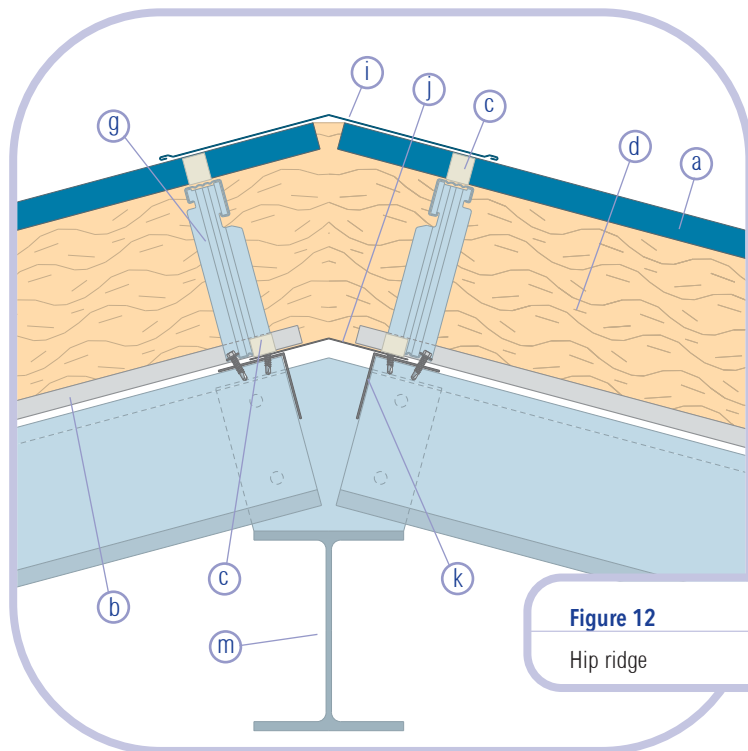


**Figure 11**

Abutment

**Key to figures 11 & 12**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Metal flashing set into brickwork with min. 150mm sealed lap joints
- f** Apron corner flashing with min. 150mm sealed lap joints sealed to brickwork with expanding foam
- g** Bar and bracket system
- h** Internal flashing with min 75mm sealed lap joints, sealed to wall with expandable seal
- i** Ridge flashing with min. 150mm sealed lap joints
- j** Internal flashing with min 75mm sealed lap joints
- k** Cleader rail
- l** Wall strap (if required)
- m** Hip rafter



**Figure 12**

Hip ridge

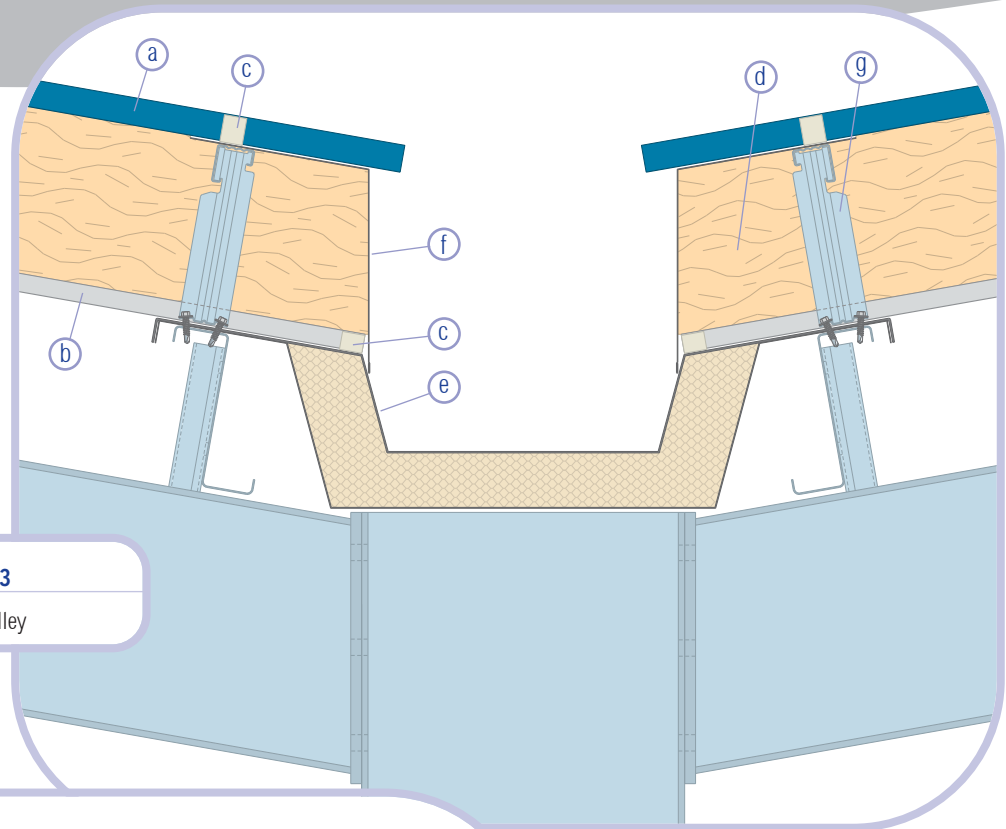
**Notes**

- Designers must ensure that walls have an appropriate thermal performance
- Cleader rail by steelwork sub-contractor

# TWIN SKIN SYSTEMS

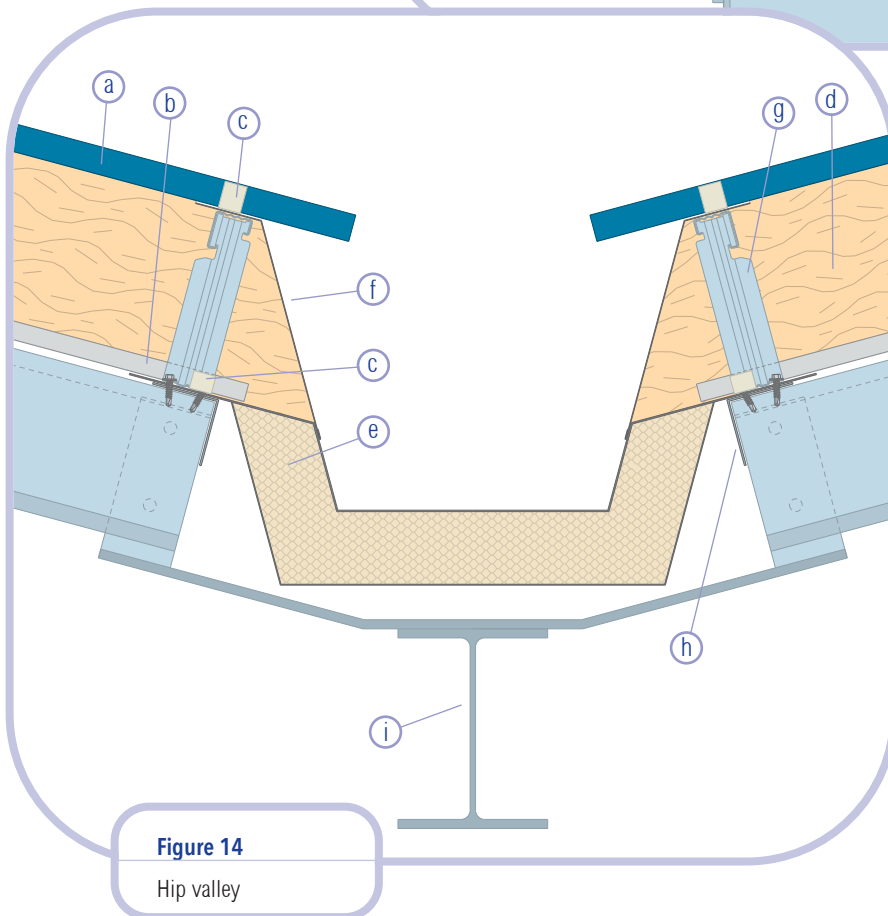
## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS



**Figure 13**

Eaves valley



**Figure 14**

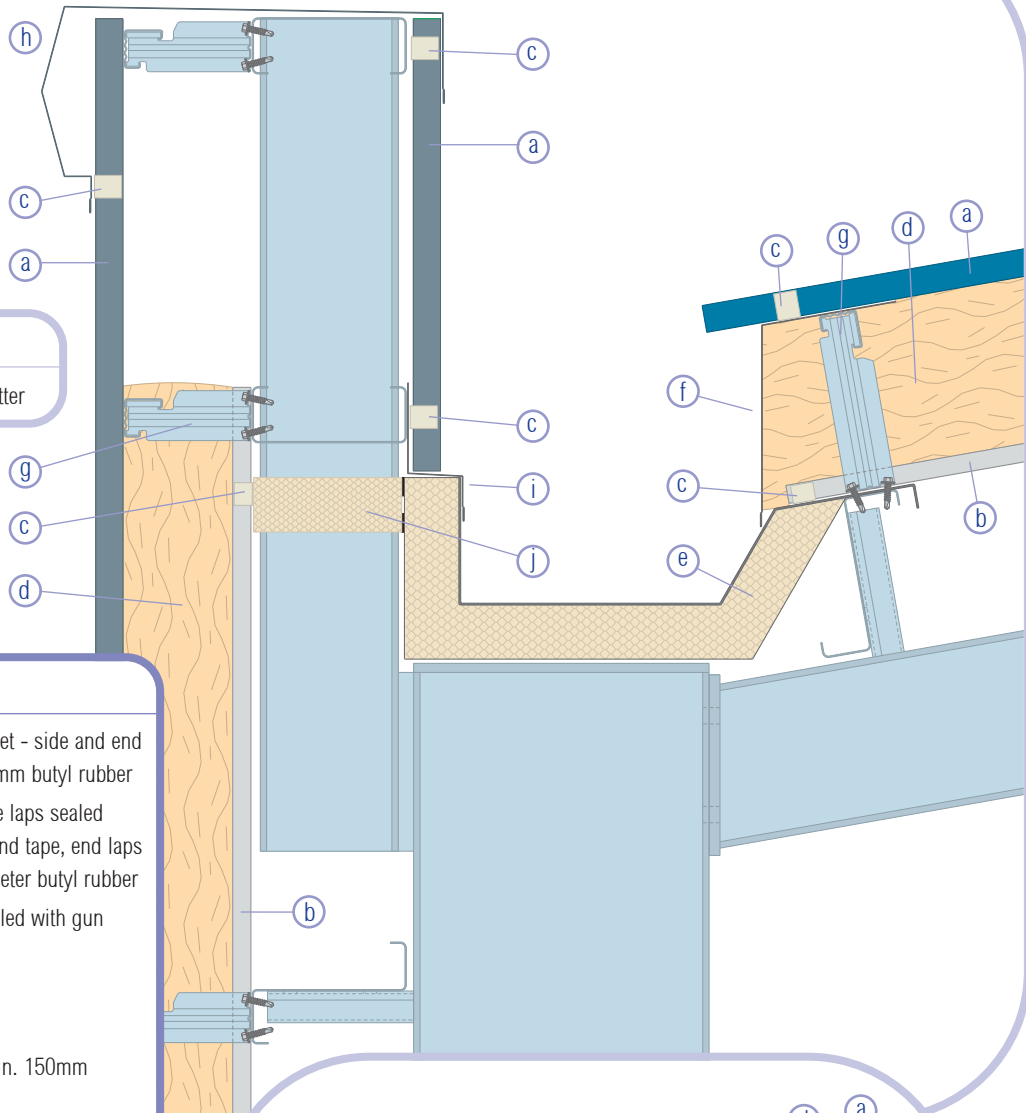
Hip valley

#### Key to figures 13 & 14

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Insulated gutter
- f** Gutter flashing with min. 150mm sealed lap joints
- g** Bar and bracket system
- h** Cleader rail
- i** Hip rafter

#### Notes

- Factory formed insulated gutter:  
60 mm PIR,  $U = 0.35 \text{ W/m}^2\text{K}$   
80 mm PIR,  $U = 0.25 \text{ W/m}^2\text{K}$



**Figure 15**

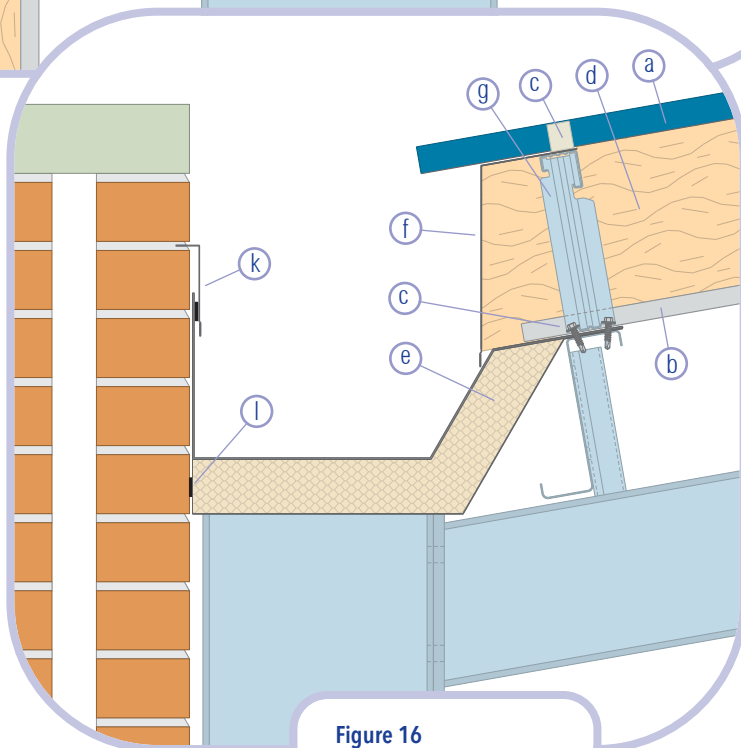
Boundary wall secret gutter

**Key to figures 15 & 16**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Insulated gutter
- f** Gutter flashing with min. 150mm sealed lap joints
- g** Bar and bracket system
- h** Cap flashing with min. 150mm sealed lap joints
- i** Drip flashing with min. 150mm sealed lap joints
- j** PIR insulation board sealed to gutter with 8mm butyl rubber air seal
- k** Metal flashing set into brickwork with min. 150mm sealed lap joints
- l** Gutter sealed to wall with 8mm butyl rubber air seal

**Notes**

- Factory formed insulated gutter:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K
- Designers must ensure that walls have an appropriate thermal performance



**Figure 16**

Parapet with secret gutter

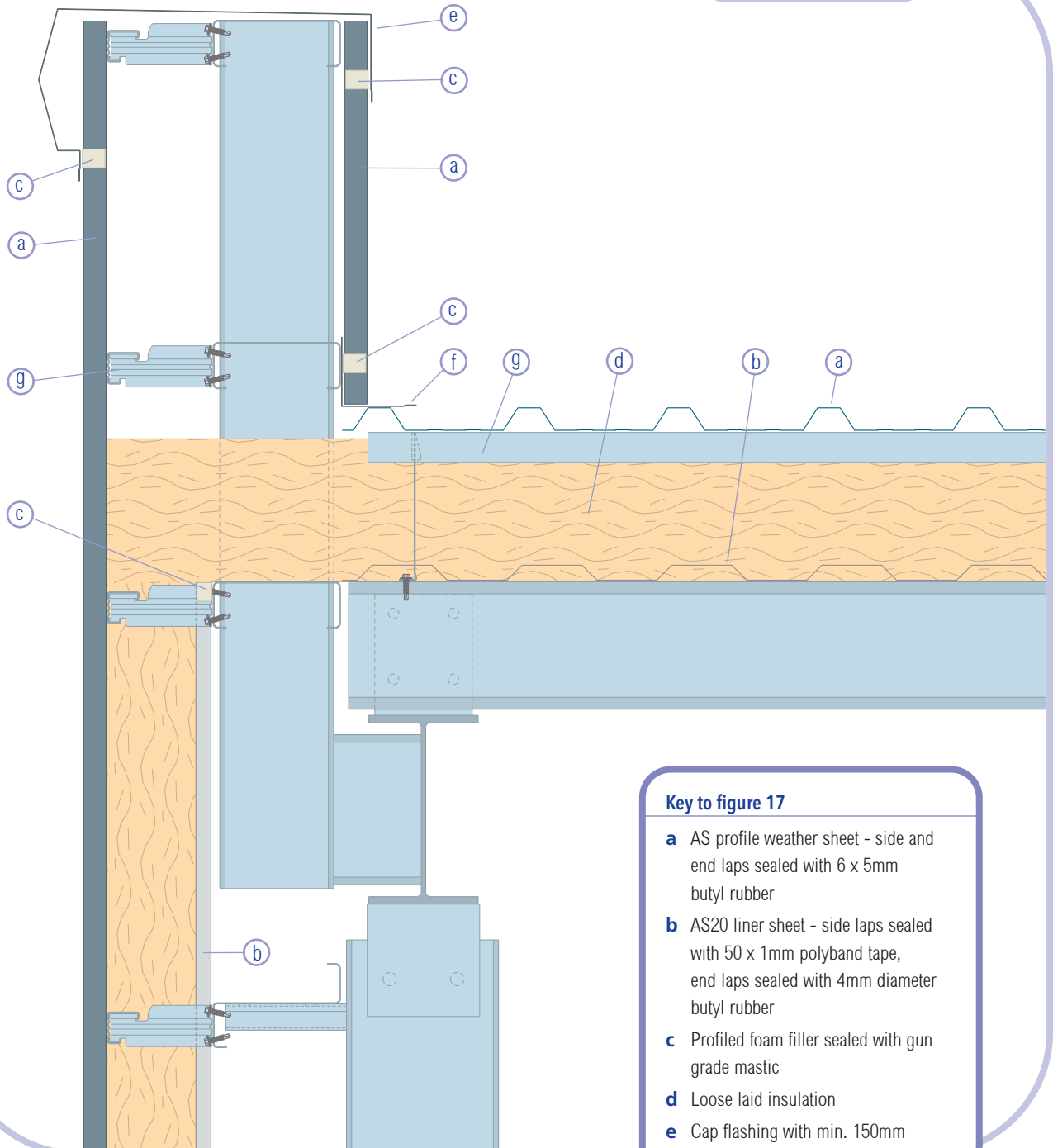
# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS

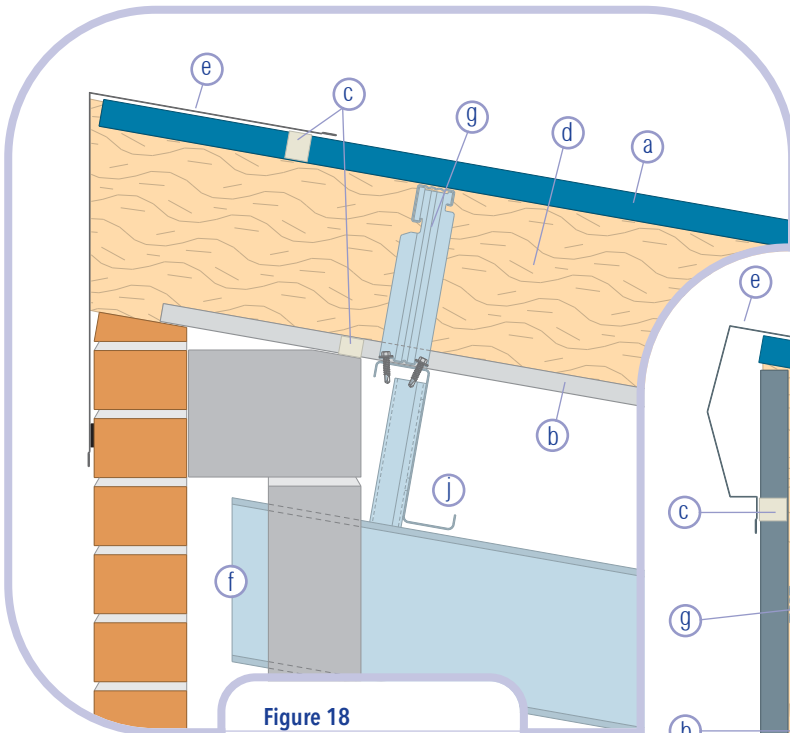
**Figure 17**

Abutment to parapet

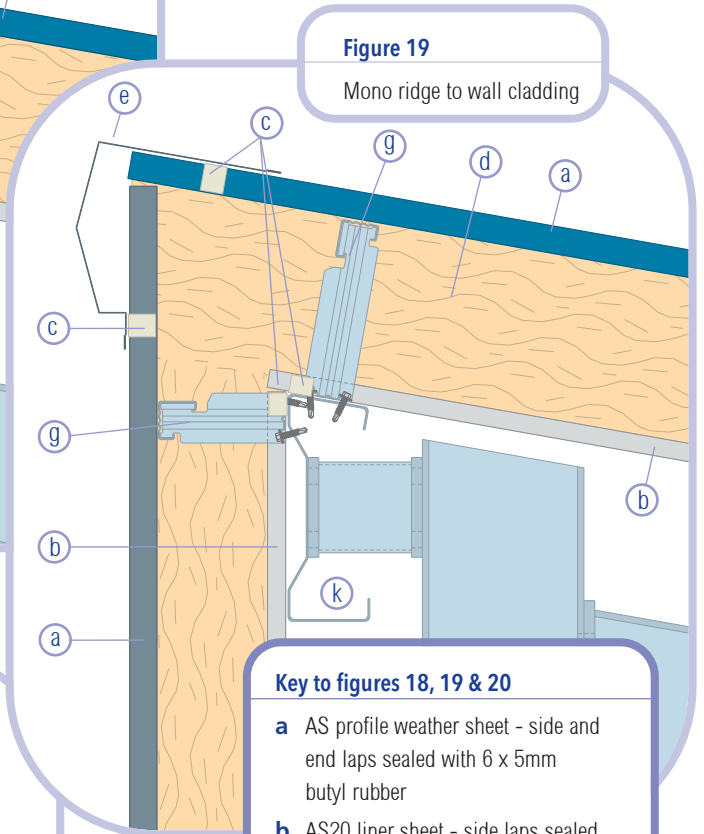


#### Key to figure 17

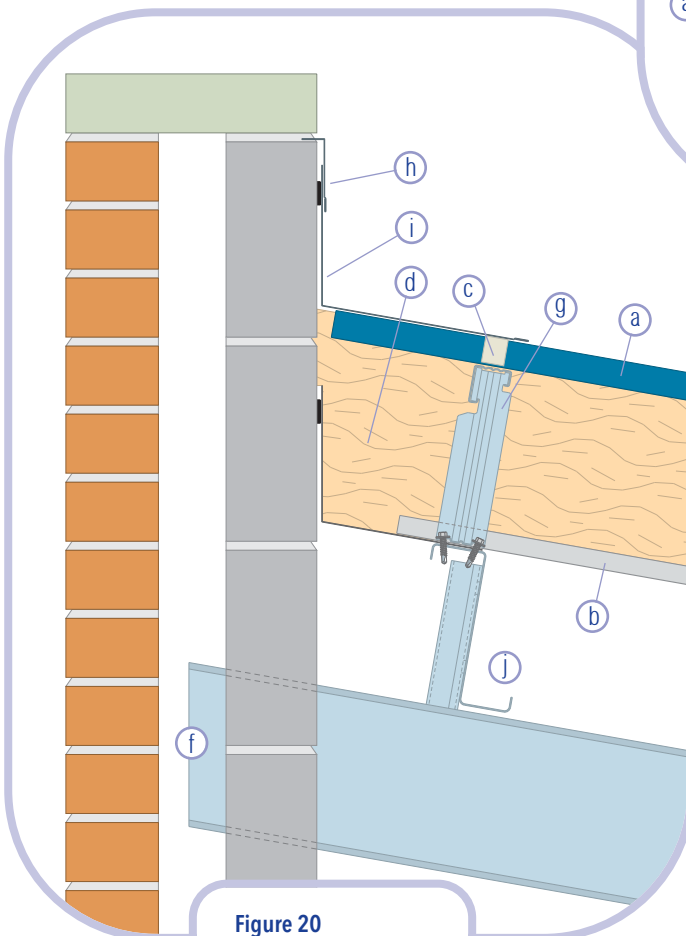
- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Cap flashing with min. 150mm sealed lap joints
- f** Apron flashing with min. 150mm sealed lap joints
- g** Bar and bracket system



**Figure 18**  
Mono ridge to brickwork



**Figure 19**  
Mono ridge to wall cladding



**Figure 20**  
Lean-to roof

**Key to figures 18, 19 & 20**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Mono ridge flashing with min. 150mm sealed lap joints
- f** Rafter built into wall
- g** Bar and bracket system
- h** Metal flashing set into blockwork with min. 150mm sealed lap joints
- i** Apron flashing with min. 150mm sealed lap joints, sealed to wall with expandable seal
- j** Purlin
- k** Eaves beam

**Notes**

- Designers must ensure that walls have an

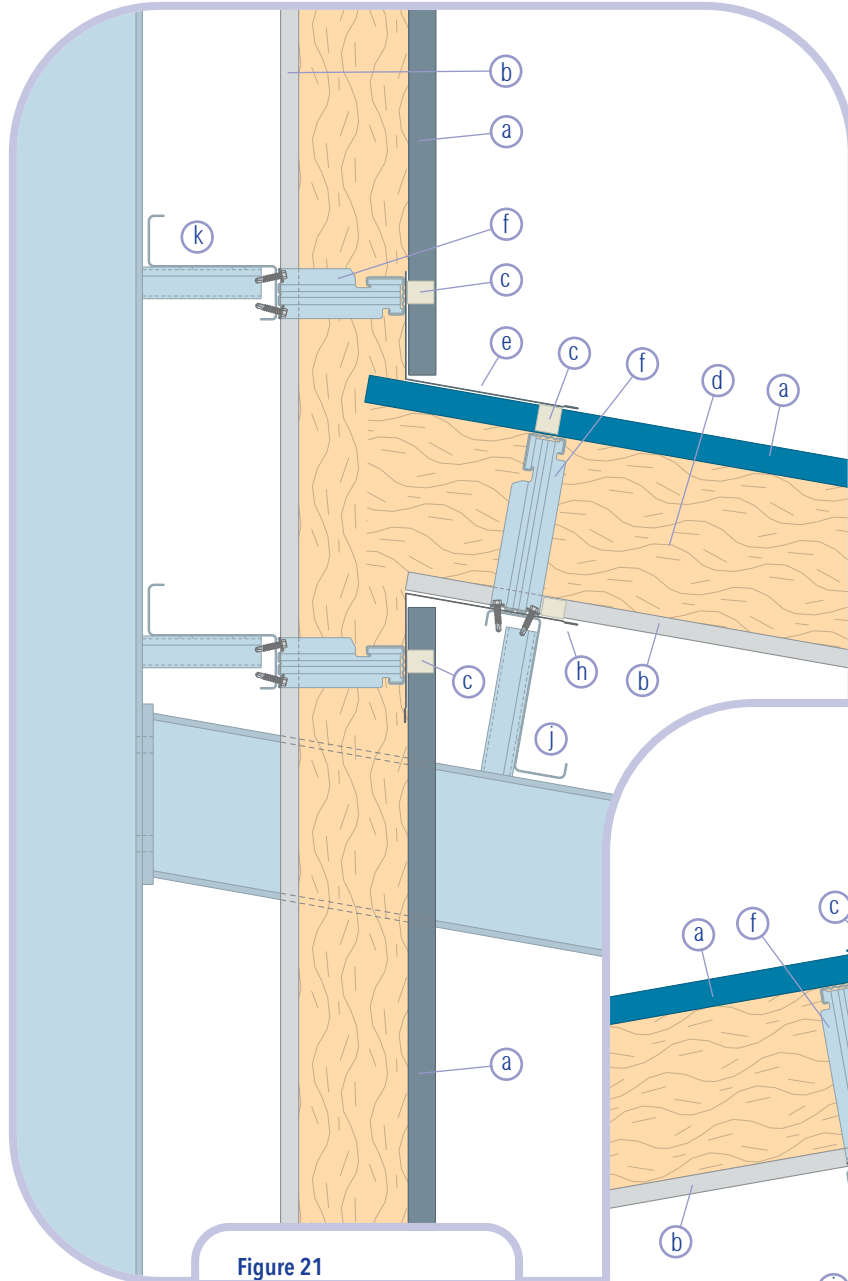
# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

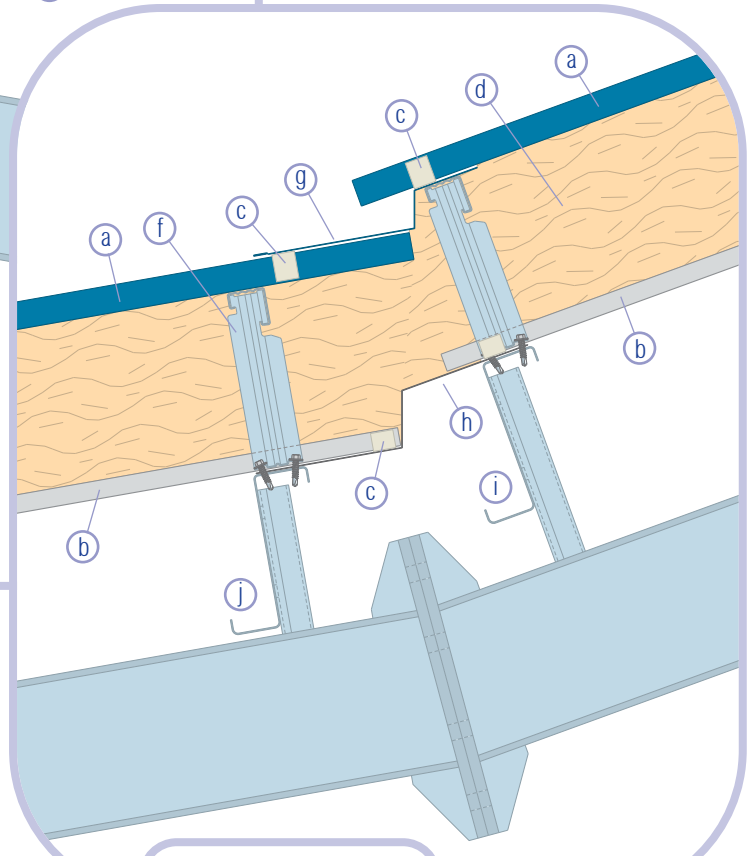
### DESIGN DETAILS

#### Key to figures 21 & 22

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Apron flashing with min. 150mm sealed lap joints
- f** Bar and bracket system
- g** External flashing with min. 150mm sealed lap joints
- h** Internal liner flashing with min. 75mm sealed lap joints
- i** Purlin on extended cleats (if req.)
- j** Purlin
- k** Side rail



**Figure 21**  
Lean-to roof to wall cladding



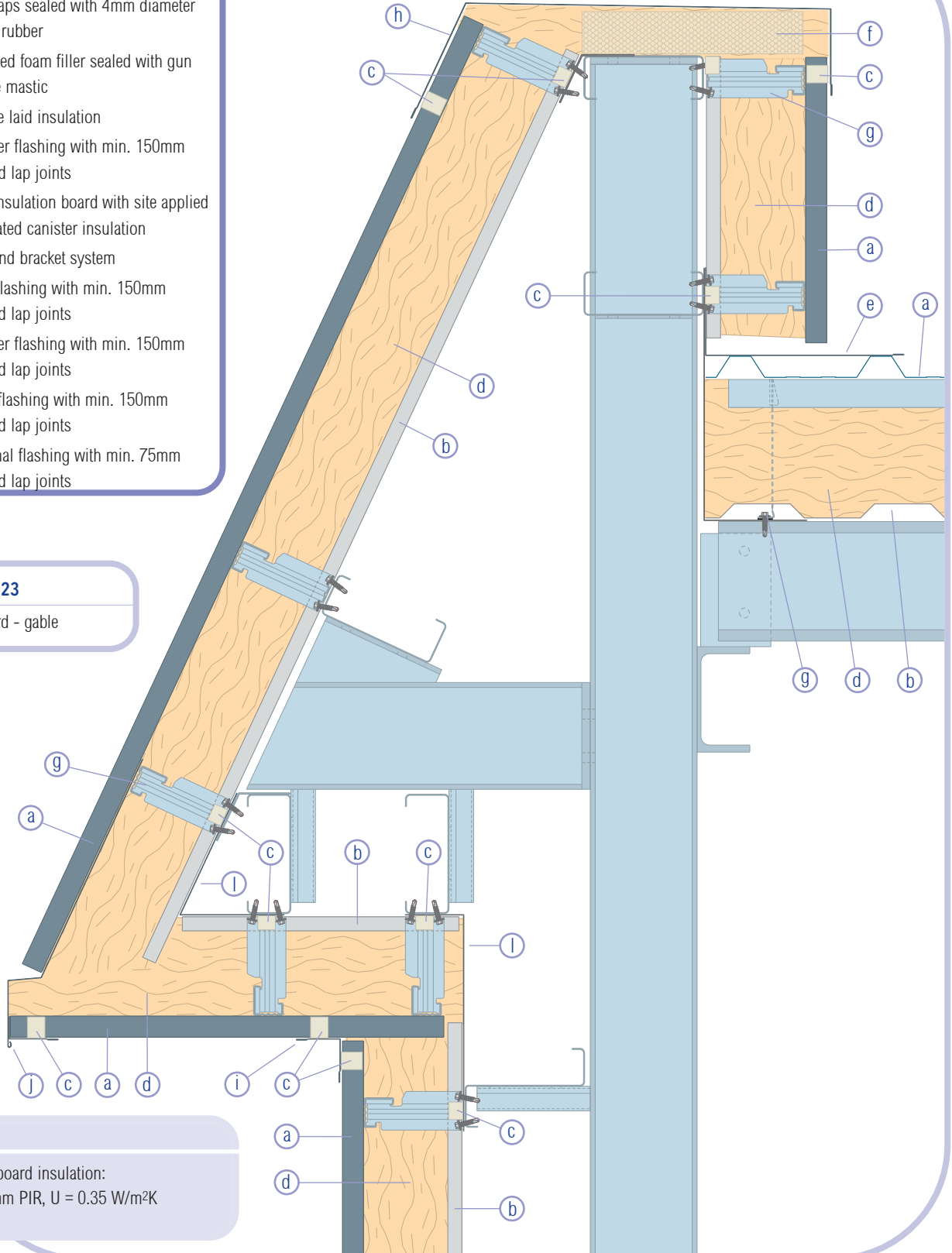
**Figure 22**  
Change in roof slope

### Key to figure 23

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Corner flashing with min. 150mm sealed lap joints
- f** PIR insulation board with site applied fire rated canister insulation
- g** Bar and bracket system
- h** Cap flashing with min. 150mm sealed lap joints
- i** Corner flashing with min. 150mm sealed lap joints
- j** Drip flashing with min. 150mm sealed lap joints
- l** Internal flashing with min. 75mm sealed lap joints

**Figure 23**

Mansard - gable



### Notes

- PIR board insulation:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K

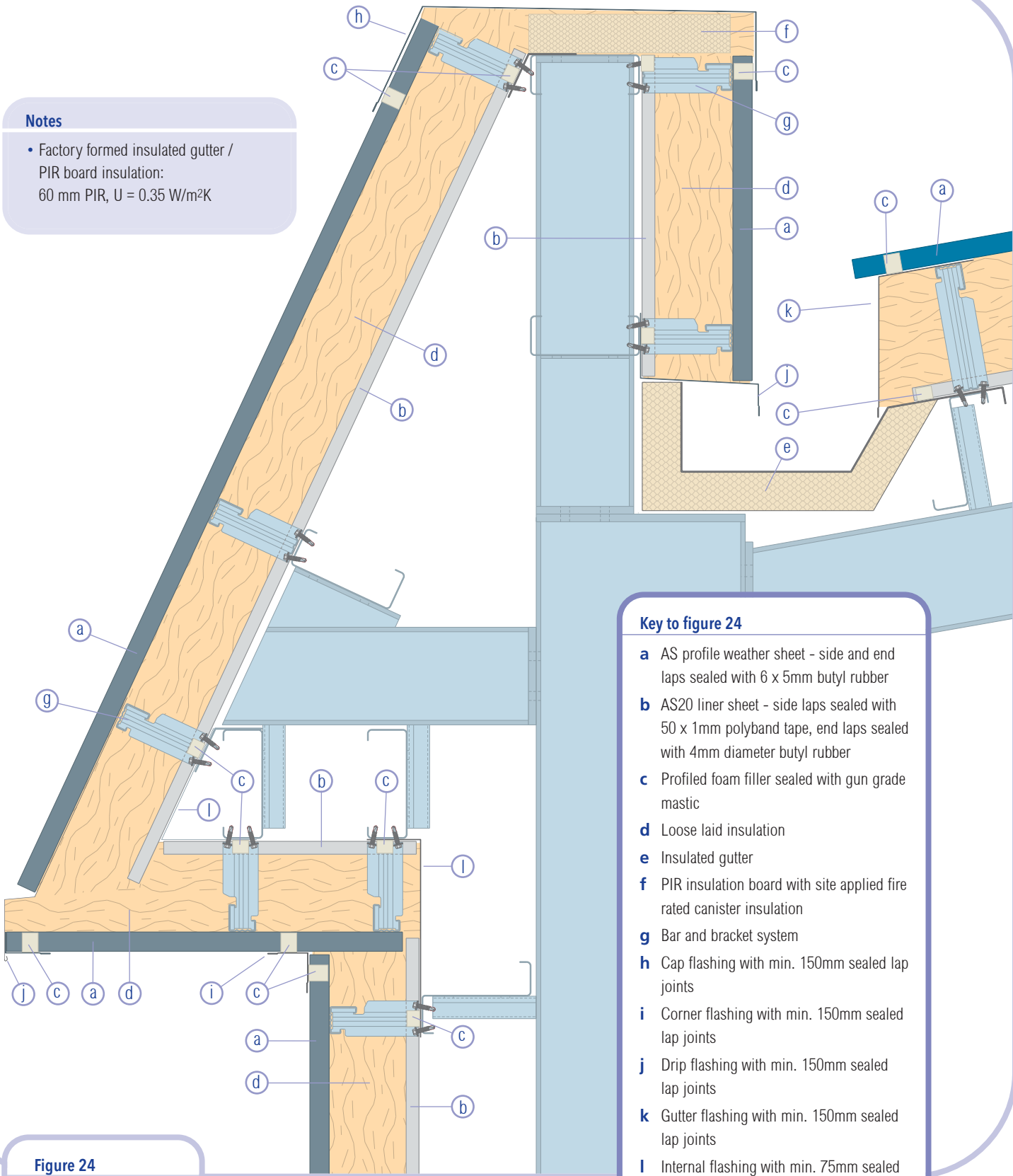
# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS

#### Notes

- Factory formed insulated gutter / PIR board insulation:  
60 mm PIR,  $U = 0.35 \text{ W/m}^2\text{K}$

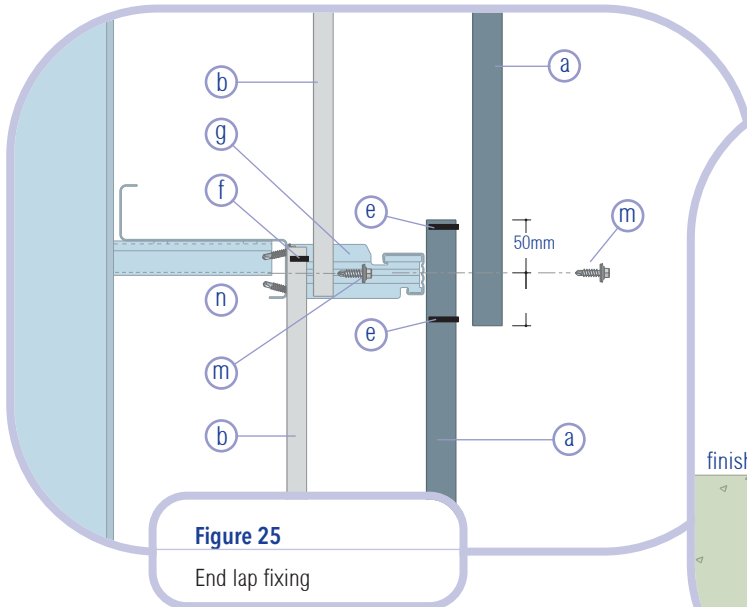


#### Key to figure 24

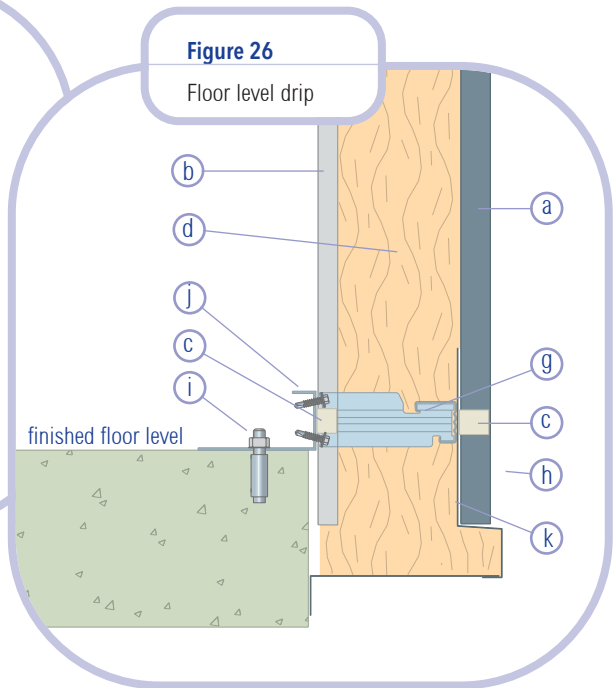
- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Insulated gutter
- f** PIR insulation board with site applied fire rated canister insulation
- g** Bar and bracket system
- h** Cap flashing with min. 150mm sealed lap joints
- i** Corner flashing with min. 150mm sealed lap joints
- j** Drip flashing with min. 150mm sealed lap joints
- k** Gutter flashing with min. 150mm sealed lap joints
- l** Internal flashing with min. 75mm sealed lap joints

**Figure 24**

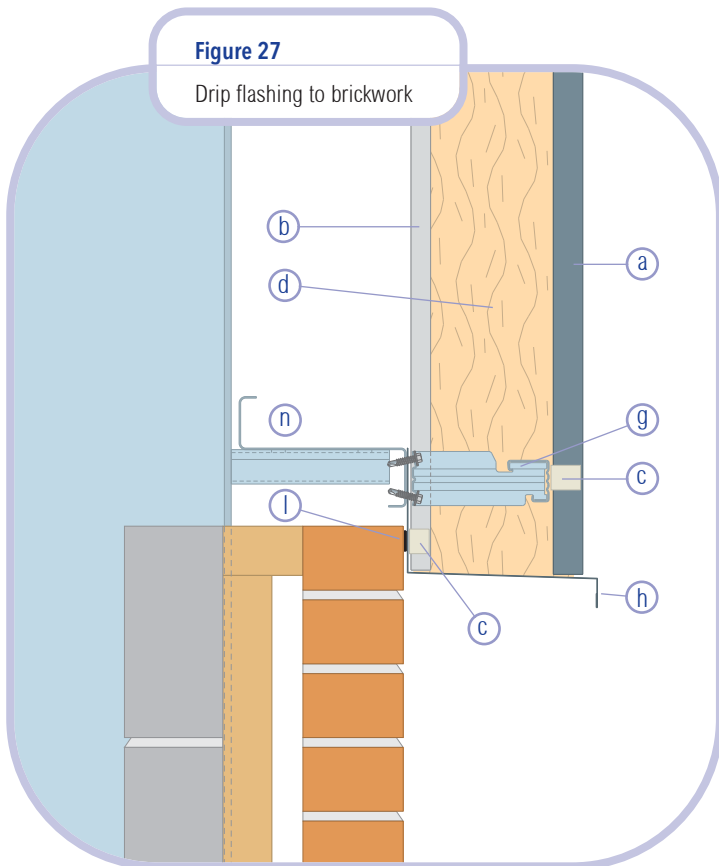
Mansard - side wall



**Figure 25**  
End lap fixing



**Figure 26**  
Floor level drip



**Figure 27**  
Drip flashing to brickwork

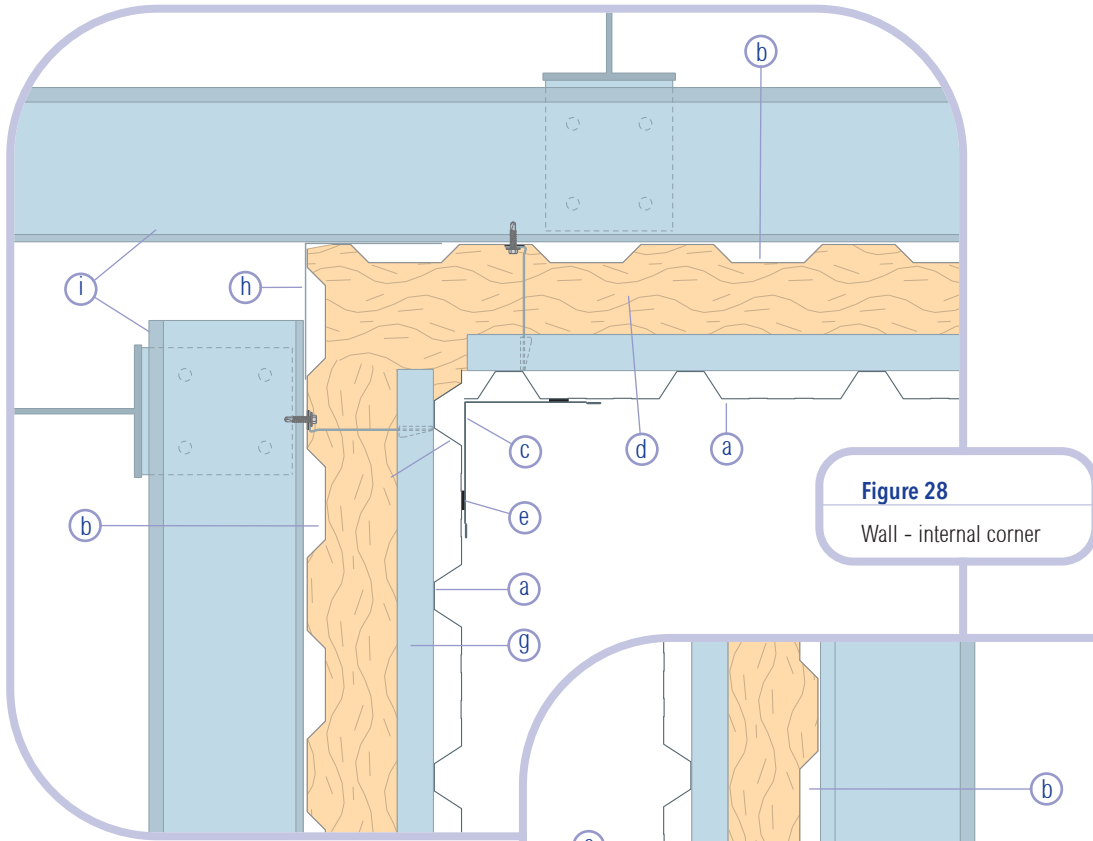
**Key to figures 25, 26 & 27**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** Seal - 6 x 5mm butyl rubber set 10 - 15mm in from each end of lap
- f** Seal - 4mm diameter butyl rubber set 10 - 15mm up slope from fixing
- g** Bar and bracket system
- h** Drip flashing with min. 150mm sealed lap joints
- i** Expanding type fixing
- j** Galvanised floor angle
- k** Soffit flashing with min. 150mm sealed lap joints
- l** Expanding foam seal
- m** Fastener with 16mm washer

# TWIN SKIN SYSTEMS

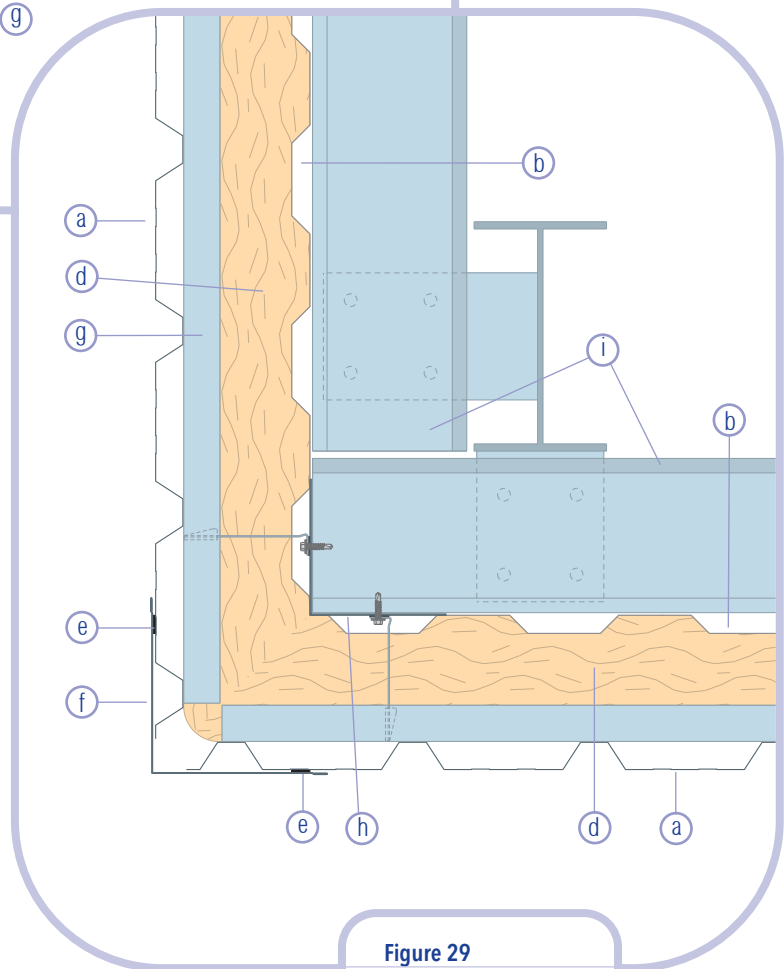
## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS



**Figure 28**

Wall - internal corner

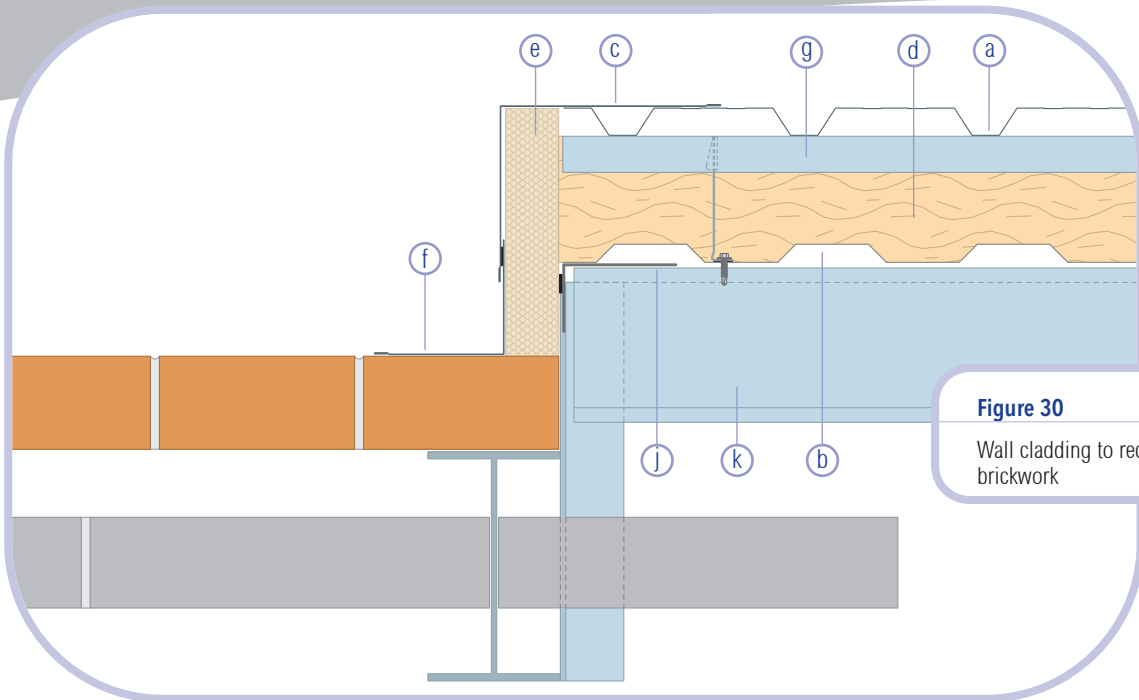


**Figure 29**

Wall - external corner

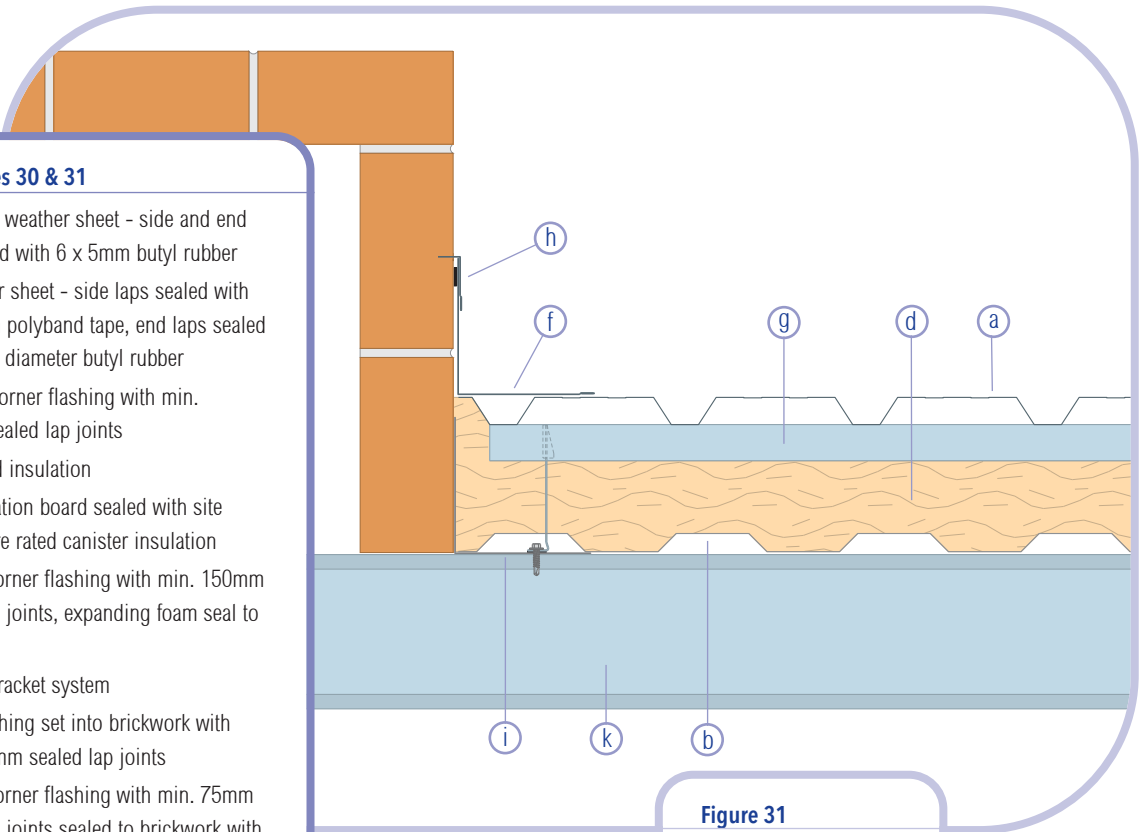
#### Key to figures 28 & 29

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Internal corner flashing with min. 150mm sealed lap joints
- d** Loose laid insulation
- e** Seal - 6 x 5mm butyl rubber
- f** External corner flashing with min. 150mm sealed lap joints
- g** Bar and bracket system
- h** Internal liner flashing with min. 75mm sealed lap joints
- i** Side rail



**Figure 30**

Wall cladding to recessed brickwork



**Figure 31**

Recessed wall cladding

**Key to figures 30 & 31**

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** External corner flashing with min. 150mm sealed lap joints
- d** Loose laid insulation
- e** PIR insulation board sealed with site applied fire rated canister insulation
- f** Internal corner flashing with min. 150mm sealed lap joints, expanding foam seal to brickwork
- g** Bar and bracket system
- h** Metal flashing set into brickwork with min. 150mm sealed lap joints
- i** Internal corner flashing with min. 75mm sealed lap joints sealed to brickwork with expanding foam seal
- j** Galvanised support
- k** Side rail

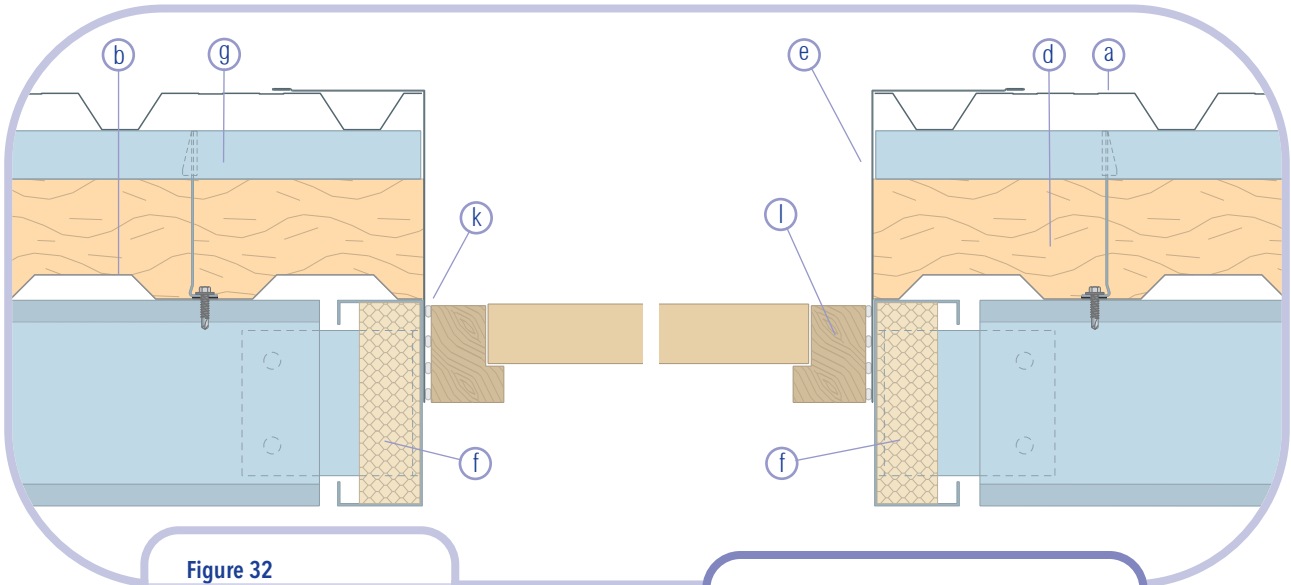
**Notes**

- PIR board insulation:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS

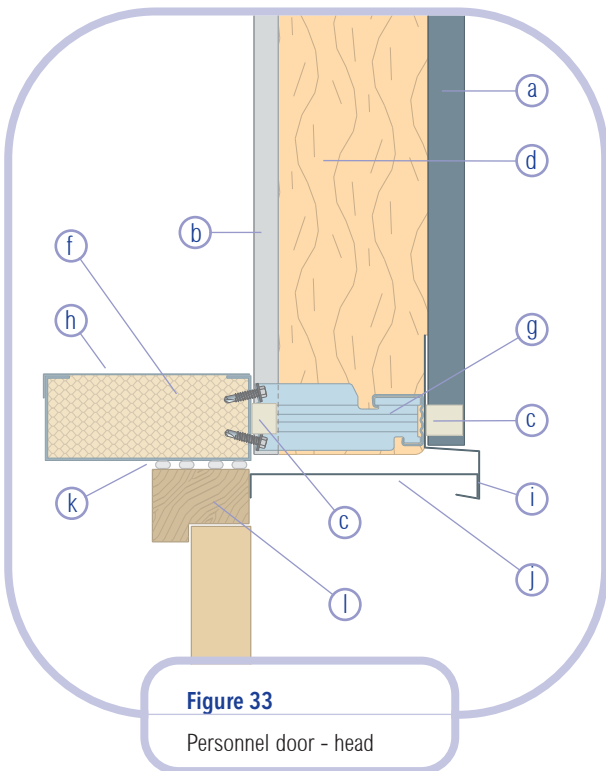


**Figure 32**

Personnel door - jamb

#### Key to figures 32 & 33

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** External door jamb flashing with min. 150mm sealed lap joints
- f** LPC approved insulation board to give required U-value, sealed with fire rated canister insulation
- g** Bar and bracket system
- h** Cover flashing
- i** Door head drip flashing with min. 150mm sealed lap joints
- j** Soffit flashing with min. 150mm sealed lap joints
- k** Polyethylene backing rod with silicone sealer (by door installers)

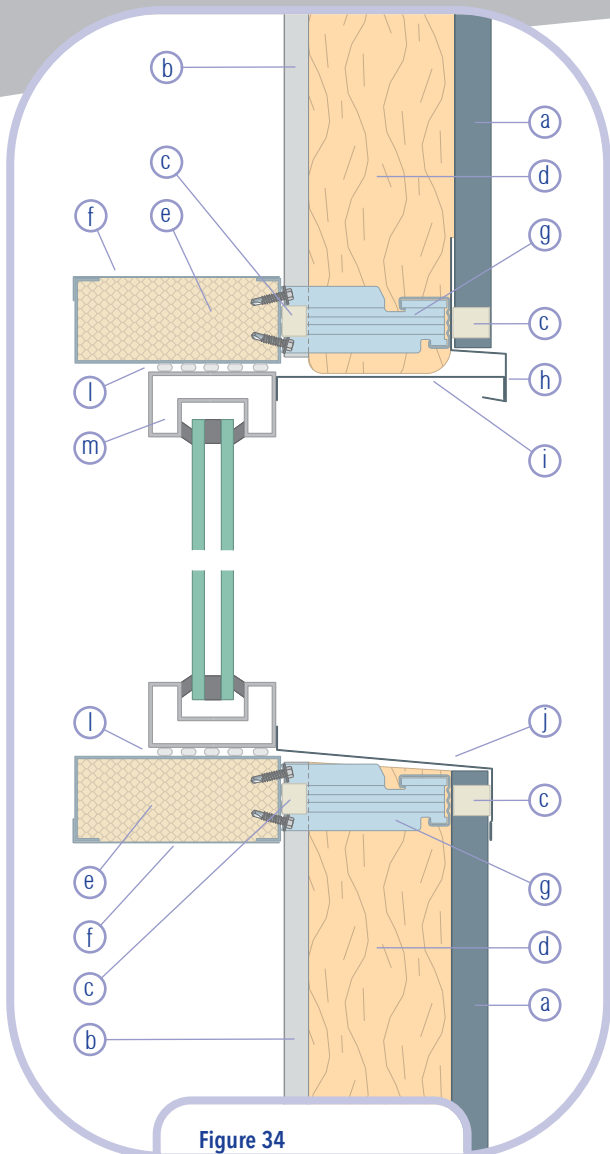


**Figure 33**

Personnel door - head

#### Notes

- PIR board insulation:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K



**Figure 34**

Window - head and cill

**Key to figures 34 & 35**

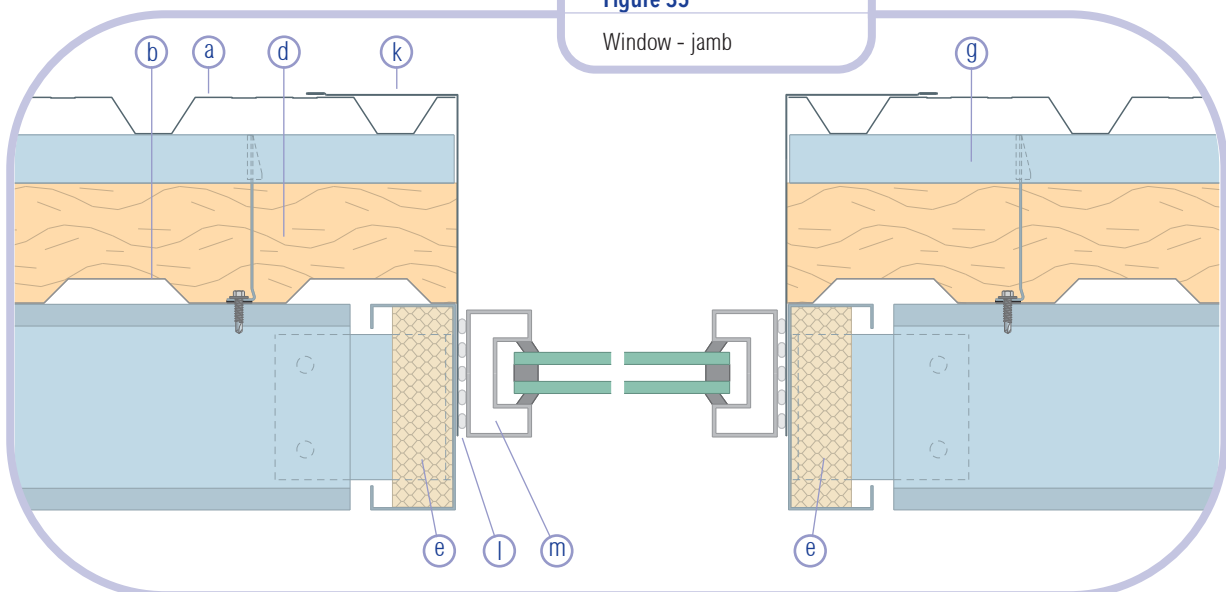
- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** Profiled foam filler sealed with gun grade mastic
- d** Loose laid insulation
- e** LPC approved insulation board to give required U-value, sealed with fire rated canister insulation
- f** Cover flashing
- g** Bar and bracket system
- h** Window head drip flashing with min. 150mm sealed lap joints
- i** Soffit flashing with min. 150mm sealed lap joints sealed to window frame with gun grade mastic
- j** Cill flashing with min. 150mm sealed lap joints with fall to allow for drainage
- k** External corner flashing with min. 150mm sealed lap joints
- l** Polyethylene backing rod with silicone sealer (by window installers)

**Notes**

- PIR board insulation:  
60 mm PIR, U = 0.35 W/m<sup>2</sup>K  
80 mm PIR, U = 0.25 W/m<sup>2</sup>K

**Figure 35**

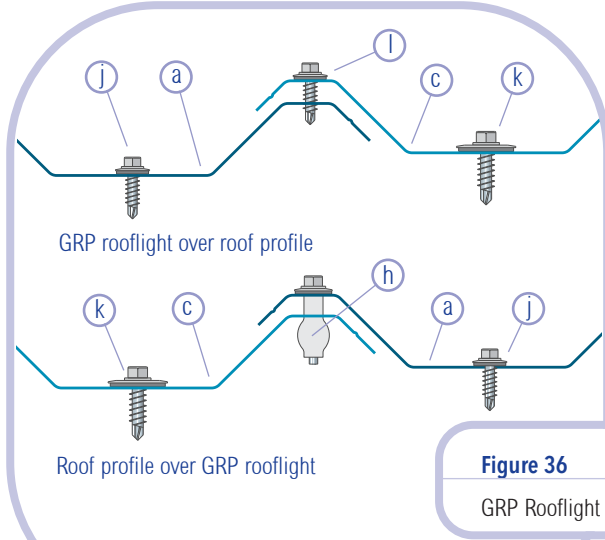
Window - jamb



# TWIN SKIN SYSTEMS

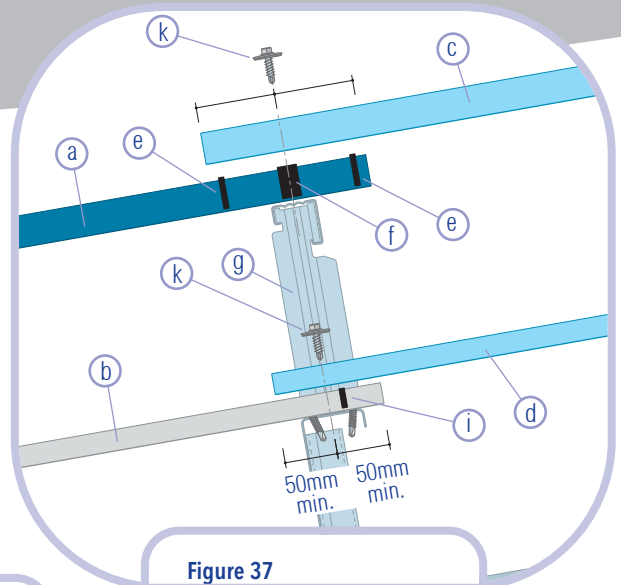
## AS SERIES ROOF & WALL PROFILES

### DESIGN DETAILS



**Figure 36**

GRP Rooflight side laps

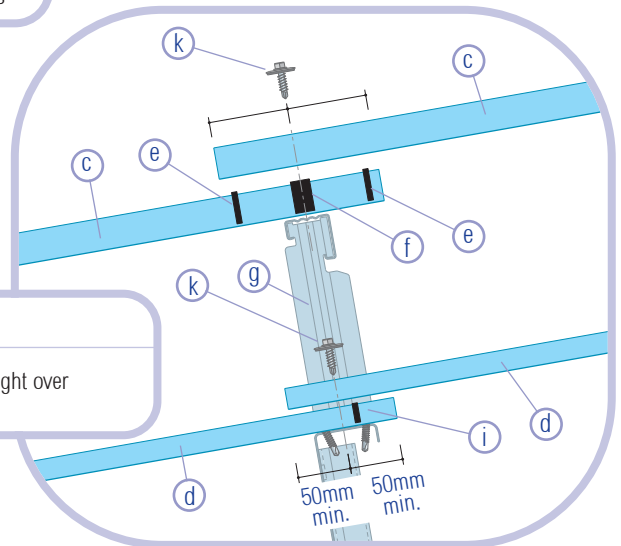


**Figure 37**

GRP rooflight over roof profile

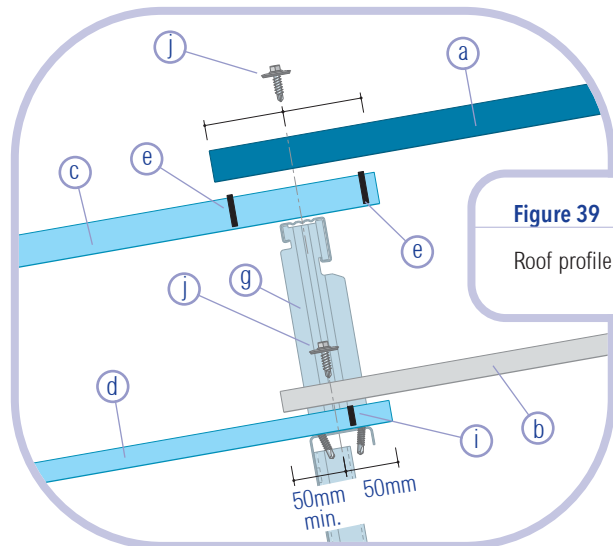
#### Key to figures 36 to 39

- a** AS profile weather sheet - side and end laps sealed with 6 x 5mm butyl rubber
- b** AS20 liner sheet - side laps sealed with 50 x 1mm polyband tape, end laps sealed with 4mm diameter butyl rubber
- c** GRP rooflight - side laps sealed with 6 x 5mm butyl rubber
- d** GRP liner rooflight - side laps sealed with 50 x 1mm polyband tape
- e** 8mm diameter butyl rubber seal 10 - 15mm in from end of the lap
- f** 18 x 4mm U-section butyl rubber seal below primary fixings
- g** Bar and bracket system
- h** Lap lock fastener with 19mm washer
- i** 4mm diameter butyl rubber seal 10 - 15mm up slope from fixing
- j** 25mm fastener with 16mm washer
- k** 25mm fastener with 29mm washer to every valley
- l** 23mm stitcher screw with 16mm washer



**Figure 38**

GRP rooflight over



**Figure 39**

Roof profile over GRP

#### Notes

- Insulation omitted from figures 37 - 39 for clarity

## SITWORK

### Handling and storage

AS profiles are delivered to site in packs. Packer sheets are used at the bottom of the packs to provide protection and the ends of the packs are wrapped with plastic. Maximum pack weight is 2 tonne.

The packs can be off-loaded directly to the roof, or to a storage area, which should be dry and well away from traffic. Packs may be stacked using suitable wooden bearers and packers. Bearers should be placed above each other.

Handle AS profiles carefully to avoid marking weather sheets or liners. Lift sheets from the pack - do not drag them. Observe site health and safety procedures and the results of manual handling and other assessments.

### Preparation

Before fixing any sheets check the squareness and accuracy of the steelwork. Determine the direction of the prevailing wind. Check sheets for damage before fixing.



### Installation

There are two methods for installing the AS twin skin system:

- working across the roof building up the whole system in one pass, or
- laying the liner across the whole roof, then laying the insulation and weather sheet. Using 0.7mm AS20/1000 or AS30/1000 as a liner will give a non-fragile roof which makes the rest of the installation process safer, and enables a higher standard of installation.

The following installation guidance presumes the second method.

### Roofs - general sequence

Observe the general installation sequence:

1. Lay liner sheet (see laying sequences for sheets below). Seal side laps with 50 x 1mm polyband tape.
2. Assemble and fix support rails and brackets.
3. Lay insulation in a continuous layer.
4. Lay and fix weather sheet (see laying sequences for sheets below).
5. Fix flashings. Use foam filler pieces and butyl sealant to form weather tight junctions.



# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### SITework

#### Roofs - single tier laying sequence

The following sequence applies to weather sheets on single tier roofs:

1. Lay the first sheet with the female edge to the gable, away from the prevailing wind. Use a string line to lay the sheet straight and true. Fix the sheet.
2. Apply butyl sealant along the top of the male crown. The surfaces receiving the sealant must be dry: joints in the sealant must be lapped by 25mm not butted.
3. Lay the second sheet with its female crown over the male crown of the first sheet. Fix the sheet.
4. Stitch the lap with self-drilling fixings.
5. Continue to lay sheets across the roof, checking the alignment of the sheeting and correcting any deviations.

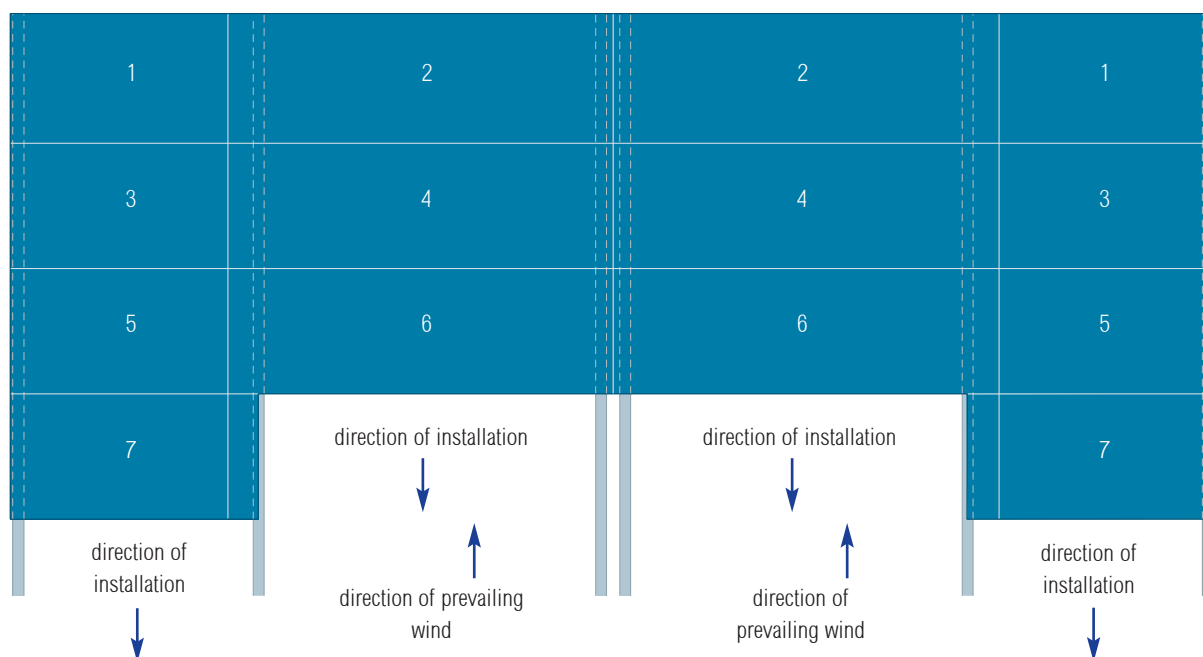


Figure 40: Roof sheet laying sequence

## SITework

### Roofs - double tier laying sequence - liner sheets

On a double tier roof lay the liner sheets in the order shown in figure 40.

1. Lay liner sheet one with the female edge to the gable, away from the prevailing wind. Use a string line to lay the liner sheet straight and true. Fix the liner sheet at every purlin except the top one.
2. Apply a single run of 4mm diameter butyl sealant to the head of liner sheet one (figure 41).
3. Lay liner sheet two with its female edge to the gable and the tail lapping the head of sheet one. Fix the liner sheet.
4. Lay liner sheet three with its female crown lapping the male crown of sheet one. Fix the liner sheet at every purlin except the top one.
5. Apply a single run of 4mm diameter butyl sealant to the head of liner sheet three (figure 42).
6. Lay liner sheet four with its female crown lapping the male crown of sheet two and its tail lapping the head of sheet three. Fix the liner sheet.
7. Apply a run of 50mm polyband sealant tape along the side lap of liner sheets one and three and liner sheets two and four (figure 43).
8. Continue to lay the liner along the roof, checking the alignment of the sheeting and correcting any deviations.

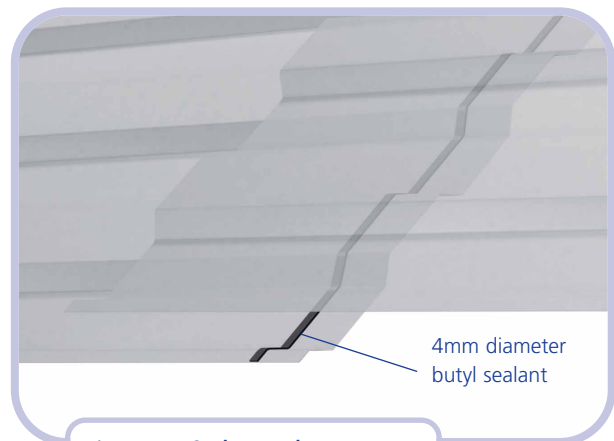


Figure 41: Sealant to sheet one

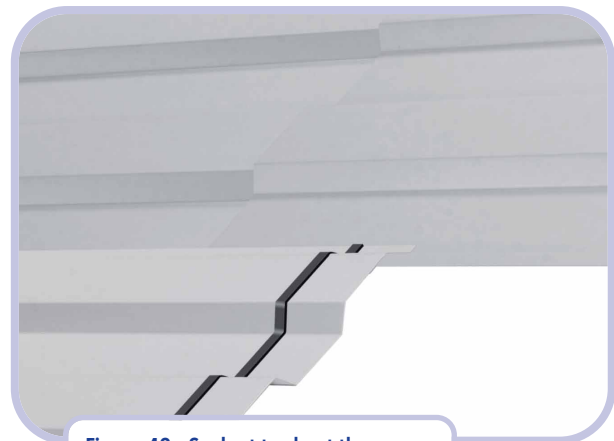


Figure 42: Sealant to sheet three

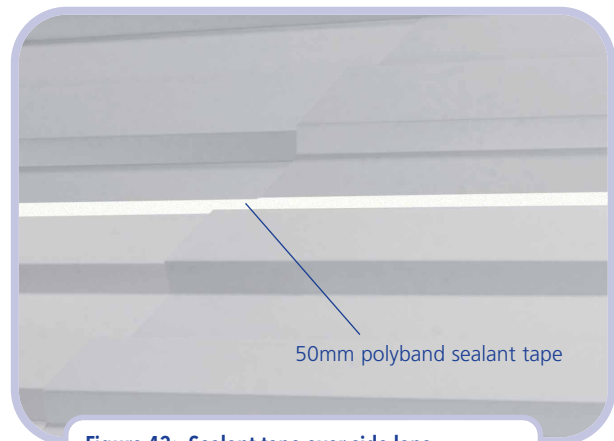


Figure 43: Sealant tape over side laps

# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### SITWORK

#### Roofs - double tier laying sequence - weather sheets

On a double tier roof lay the weather sheets in the order shown in figure 40.

1. Lay weather sheet one with the female edge to the gable, away from the prevailing wind. Use a string line to lay the sheet straight and true. Fix the sheet at every purlin except the top one.
2. Apply two runs of 6 x 5mm butyl sealant to the head of weather sheet one and a run of butyl sealant to the male crown for the length of the lap (figure 44).
3. Lay weather sheet two with its female edge to the gable and the tail lapping the head of sheet one. Fix the sheet.
4. Apply a run of butyl sealant to the male crown of sheets one and two (figure 45).
5. Lay weather sheet three with its female crown lapping the male crown of sheet one. Fix the sheet at every purlin except the top one.
6. Stitch the side lap with self-drilling fixings.
7. Apply two runs of 6 x 5mm butyl sealant to the head of weather sheet three and a run of butyl sealant to the male crown for the length of the lap. Ensure the sealant laps the run on the male crown of sheet two (figure 46).
8. Lay weather sheet four with its female crown lapping the male crown of sheet two and its tail lapping the head of sheet three. Fix the profile.
9. Stitch the side lap with self-drilling fixings.
10. Continue to lay the sheets along the roof, checking the alignment of the sheeting and correcting any deviations.

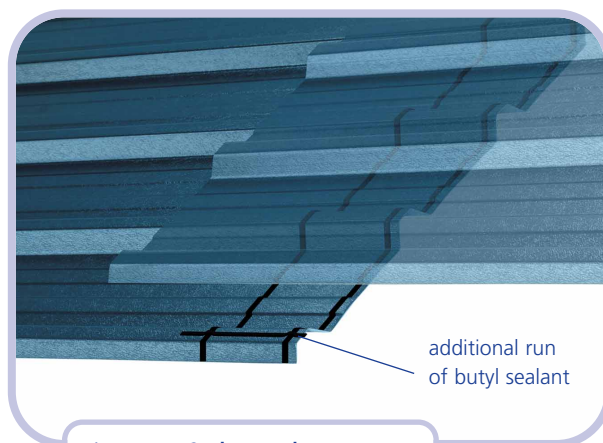


Figure 44: Sealant to sheet one



Figure 45: Sealant over sheets one & two

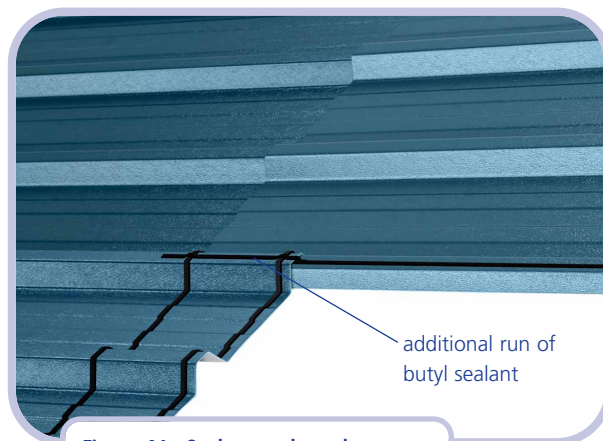


Figure 46: Sealant to sheet three

## SITWORK

### Walls - general sequence

Observe the general installation sequence:

1. Fit liner sheets with temporary screws (see sequences for liner sheets on page 43).
2. Assemble and fix support rails and brackets.
3. Fit insulation in a continuous layer: clip in place until the weather sheets are installed.
4. Fit and fix weather sheets (see sequences for weather sheets on page 44).
5. Fix flashings. Use foam filler pieces and butyl sealant to form weather tight junctions.

### Walls - laying sequence

The following sequence applies to weather sheets on walls:

1. Set sheet one upright against the framing at the corner of the building with the female edge to the corner. Make sure the profile is vertical.
2. Fix with one fixing in alternate valleys at each rail.
3. Apply a run of butyl sealant along the male crown.
4. Set sheet two upright with its female edge lapping the male edge of sheet one.
5. Fix the sheet.
6. Stitch the lap with self-drilling fixings (weather sheets only).
7. Continue to lay sheets along the wall, checking the alignment of the cladding and correcting any deviations.

### Cutting profiles

Where profiles have to be cut on site:

- Use a powered reciprocating saw or circular saw. Do not use an abrasive wheel.
- Support the profile along the line of the cut.
- Protect the pre-coated finishes of the profile.
- Clean any swarf or debris from the pre-coated finish of the profile immediately.

### Completion

When all the sheets have been installed check:

- All fixings are correctly fitted and tightened;
- The fixings do not distort the profile;
- All fixing caps are fitted;
- Minor scratches have been treated;
- The surface of the roof is clean and free of any swarf or debris.



# TWIN SKIN SYSTEMS

## AS SERIES ROOF & WALL PROFILES

### MAINTENANCE

#### Annual inspection

It is good practice to carry out annual inspection of the building exterior and to carry out any remedial work identified during the inspection, see table 31.

#### Touch-up

Minor scuffing of the colour coating should not be treated. Deeper scratches which reach the substrate should be repaired with touch-up paint.

The touch-up paint should only be applied to the original scratch using a fine paint brush.

As touch-up paint will dry to a slightly different colour than the original coating the area which is touched up should be kept as small as possible.

### SUPPLY AND DELIVERY

The AS twin skin system is available directly from Steadmans. Sheets are supplied in plastic wrapped packs. Fully timber crated packs are available for sea freight shipping at additional cost.

AS profiles are usually delivered to site. Off loading is the responsibility of the customer. Delivery by self off-load vehicles can be arranged.

**Table 31: Checklist for annual inspection**

Check for:	Remedial action:
Blocked gutters, which may cause overflow into the building.	Clean gutters and wash out any blockage.
Build-up of debris, which can retain water and cause corrosion.	Remove debris.
Dirt retention on areas not washed by rainwater: that affects the appearance of the building and, if left untreated, could cause the coating to breakdown.	Wash down with fresh water using a hose and soft bristle brush. Heavy deposits can be removed with a solution of water and household detergent or proprietary cleaner.
Mould growth, which is rare, but can affect the appearance of the building.	Wash down, then apply a cleansing solution: consult Steadmans Technical Department for guidance.
Local damage - breakthrough of the panel coating could result in corrosion of the substrate.	Assess the extent of the damage and either touch up (see opposite) or over-paint the affected area or replace damaged sheets.
Drilling swarf and fixing debris.	Remove debris.
Condition of fixings - faulty fixings can cause leaks or rust staining on the surface of the panels.	Replace faulty fixings and missing clips.
Corrosion of cut edges.	Cut or abrade edges back to clean bright metal and repaint: consult Steadmans

## TECHNICAL SUPPORT

Steadmans offers comprehensive technical support to designers and contractors working with AS profiles, including:

- technical brochures and data sheets for all Steadmans products
- CAD details
- copies of test certificates
- loading calculations
- design and installation guidance

Our web site offers full product and application information and downloads of construction details in AutoCAD and PDF formats.

[www.steadmans.co.uk](http://www.steadmans.co.uk)

To contact our Technical Department:

- telephone: 01697 478 277
- fax: 01697 478 530
- email: [support@steadmans.co.uk](mailto:support@steadmans.co.uk)

## REFERENCES

- Approved Documents
  - A Structure
  - B Fire safety
  - C Site preparation and resistance to contaminants and moisture.
  - L2A Conservation of fuel and power in new buildings other than dwellings.
  - L2B Conservation of fuel and power in existing buildings other than dwellings.
- The Scottish Building Standards: Technical Handbook.
  - Non-domestic.
- BS 476 Fire tests on building material and structures.
  - BS 476-3:2004 Classification and method of test for external fire exposure to roofs.
  - BS 476-7:1997 Method of test to determine the classification of the surface spread of flame of products.
  - BS 476-22:1987 Methods for determination of the fire resistance of non-loadbearing elements of construction.
- BS 5250:2002 Code of practice for control of condensation in buildings.
- BS 5950 Structural use of steelwork in building.
  - BS 5950-2:2001 Specification for materials, fabrication and erection. Rolled and welded sections.
- BS 8206 Lighting for buildings.
  - BS 8206-2:2008 Code of practice for daylighting.
- BS EN 10143:2006 Continuously hot-dip coated steel sheet and strip. Tolerances on dimensions and shape.
- BS EN 10346:2009 Continuously hot-dip coated steel flat products. Technical delivery conditions.
- BS EN 12056 Gravity drainage systems inside buildings.
  - BS EN 12056-3:2000 Roof drainage, layout and calculation.
- BS EN ISO 10211:2007 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations.
- BS EN ISO 13788:2002 Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation. Calculation methods.
- MRCMA Technical paper 14. Guidance for the design of metal roofing and cladding to comply with Approved Document L2: 2001
- TM 37: Design for improved solar shading. 2006

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Online: [www.steadmans.co.uk](http://www.steadmans.co.uk)

**ENVIRONMENTAL CREDENTIALS**

We recognise the need to manage the impact which our business and processes have on the environment. We believe we have a responsibility to contribute to the well-being of the communities we live in. We are committed to providing a clean, safe environment.

Developing sustainable construction methods presents a challenge to the whole construction industry. Our main raw material, steel, is eminently recyclable: 85 - 90% of steel from demolition goes for re-use and 40% of steel used in new construction has been recycled.

By using modern machinery and upgrading our facilities we are continually reducing the impact of our products on the environment, and improving their contribution to the long-term performance of buildings.

[www.steadmans.co.uk](http://www.steadmans.co.uk)

