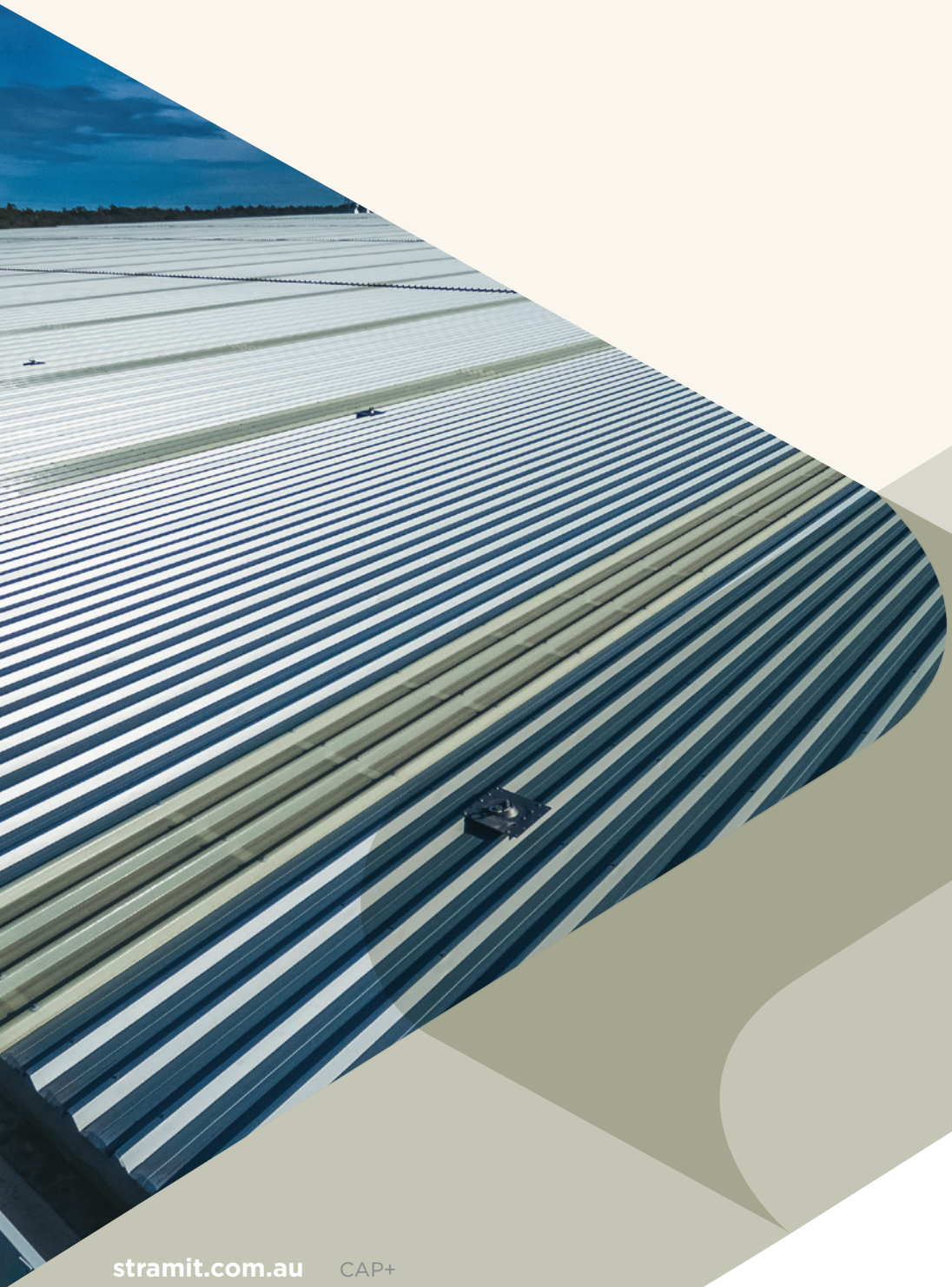
Stramit
CONSIDER IT DONE

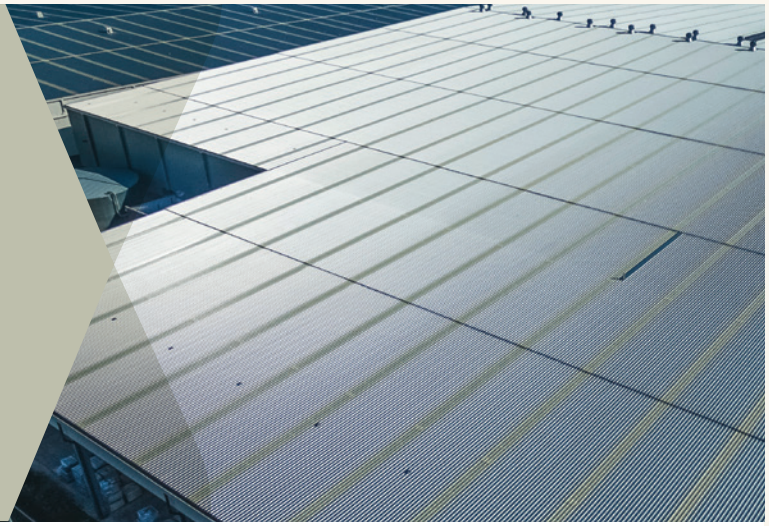
CAPACITYPLUS™660 DEEP ROOF CLADDING

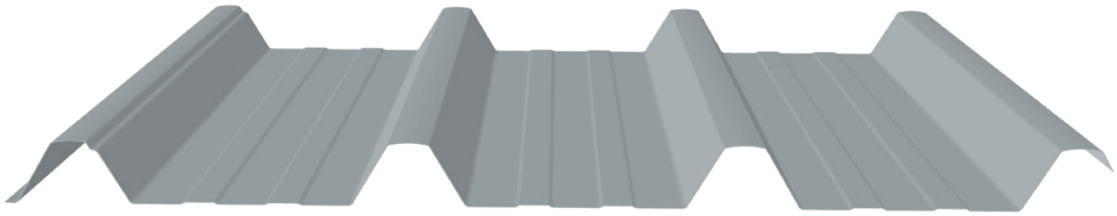
Product Technical Manual



Part of Fletcher Building

SELECTION AND SPECIFICATION





FEATURES/BENEFITS

- High 50mm ribs – excellent water-carrying capacity at low roof pitch and superior profile rigidity.
- Simple rib shape – enables reliable screw fixing, and easy to trim and notch flashings.
- Wide 660mm cover – enabling fast handling and laying, and cost economy.
- Screw fixed – allows fast and flexible high-wind installation techniques such as 'tack and screw-off'.
- Range of materials – choice of materials and finishes for enhanced durability options.
- Low 1° pitch – building economies due to low wall heights and structure reduction.
- Fully tested – in-house and independent testing for reliable design data and peace-of-mind.
- Nesting profile – flat packs for economical transport and site crane handling.

APPLICATIONS

The drainage capacity, strength, wide cover, light weight and weather resistance of CapacityPLUS™ 660 cladding make it perfect for large commercial roofing and walling applications. Its excellent strength and ease of assembly allow for long, economical spans. The large water-carrying capacity and weather-tightness permit very low roof pitches, leading to economies in the building structure.

CapacityPLUS™ 660 cladding is only intended for use in commercial/industrial/residential roof and wall cladding applications. Do not use for any other purpose.

MATERIALS

CapacityPLUS™ 660 cladding is manufactured from high yield strength G550 colour coated steel, aluminium-zinc-magnesium or zinc-aluminium alloy coated steel. In some locations galvanised and severe environment or stainless colour coated steel may be available by arrangement. Colour coated steels are in accordance with AS/NZS2728 – Category 3 and, for the substrate, with AS1397. Aluminium-zinc-magnesium alloy coated AM100/AM125 or ZM275, zinc aluminium-alloy coated AZ150 and galvanised Z450 conform to AS1397. Stramit has a comprehensive range of colours as standard. Ask at your nearest Stramit location for colour availability.

CapacityPLUS™ 660 CLADDING - SHEETING MASS (kg/m² of roof area)		
	ZINCALUME®	COLORBOND® / MagnaFlow®
0.42mm steel BMT	4.89	4.97
0.48mm steel BMT	5.56	5.64

ADVERSE CONDITIONS

CapacityPLUS™ 660 roof and wall cladding will give excellent durability in almost all locations. It is however important to choose the correct coating for each application environment as shown in the table below. Durability recommendations do vary based on the application of the product, in roofing or walling installations. Please read the tables below carefully.

Suitability of coating type	Roof sheeting - site exposure condition			Wall cladding- distance from marine environment
	mild/ moderate	severe marine	very severe marine	
Zinc-Aluminium (AZ150)	✔	✘	✘	>1km
ZINCALUME® (AM125)	✔	✘	✘	>1km
COLORBOND®	✔	✘	✘	>1km
COLORBOND® METALLIC	✔	✘	✘	>1km*
COLORBOND® ULTRA	N/A	✔	✘	>500m
MAGNAFLOW®	N/A	✔	✘	>500m
COLORBOND® STAINLESS	N/A	N/A	✔	>0m

* >2km residential building.

The approximate site exposure conditions in the table above are defined below.

Site exposure condition	Roof sheeting - distance of site from	
	breaking surf / exposed marine	calm marine
mild/moderate	>200m	>100m
severe marine	>100m	>0m
very severe marine	>0m	>0m

The suitability and exposure tables above are current at the time of publication and are guidelines only; conditions will vary from site to site. Please check the Bluescope Technical Bulletins at www.bluescopesteel.com.au for the latest information and guidance on selection, maintenance and durability. If uncertain about the appropriate coating for a particular application, or if the product is to be used in environments affected by industrial emissions, fossil fuel combustion, animal farming, or has unwashed areas, please contact your nearest Stramit office for advice.

COMPATIBILITY

All building products need to be checked for compatibility with adjacent materials, whether they be part of the current project or pre-existing or planned building elements. These checks need to be for both direct contact between materials, and where water runs from one material to another. The following guidelines generally avoid material incompatibility:

- For ZINCALUME®, COLORBOND®, MagnaFlow® and galvanised roofs avoid copper, lead, green or treated timber, stainless steel and mortar or concrete.
- In addition galvanised roofs should not receive drainage from aluminium, copper or any inert materials, such as plastics, glass, glazed tiles, MagnaFlow®, COLORBOND® and ZINCALUME® Contact Stramit for more detailed information.

TESTING

Stramit has in-house, purpose built, testing equipment used to design, develop and improve products for the Australian market. In addition many Stramit® products are tested or witnessed by independent organisations.

This ongoing research and development activity ensures that Stramit remains at the forefront of innovation, design and consumer information.

ARCHITECTURAL SPECIFICATION

This specification may be used to ensure that required performance and functional needs are met:- The roofing/walling shall be CapacityPLUS™ 660 cladding in continuous lengths with trapezoidal ribs approximately 50mm high, spaced at 220mm centres.

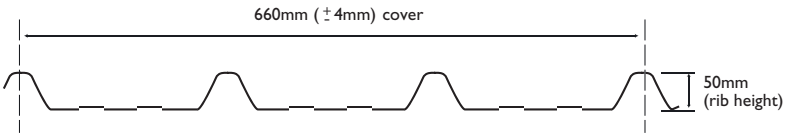
Sheeting material shall be 0.42mm or 0.48mm bmt G550 protected steel sheet to Australian Standard AS1397, with a minimum yield stress of 550MPa (Grade G550) and an AM100/AZ150 or ZM275 coating with an oven-baked paint film of selected colour, or a plain AM125/AZ150 coating.

The sheeting shall be fixed to the purlins/girts in accordance with the manufacturer's recommendations. Suitable fixing screws in accordance with Australian Standards AS3566, Class 3*, shall be used at every rib at every support with side lap fasteners installed at mid span if required. A minimum of 50mm shall be provided for projection into gutters. Flashings shall be supplied in compatible materials as specified; minimum cover of flashing shall be 150mm.

All sheeting shall be fixed in a workman-like manner, leaving the job clean and weathertight. Repair minor blemishes with touch-up paint supplied by the roof manufacturer. All debris (nuts, screws, cuttings, filings etc.) shall be cleaned off daily.

* Class 4 fasteners should be used <1km from the coast.

DESIGN



SPANS

The spans shown below take account of 'normal' foot traffic and wind resistance including local pressure zone effects. Pressures are based on AS4055 or AS/NZS1170.2. Where the two standards differ, the worst case has been taken for each classification.

Data should only be used for buildings 7m or less in height, 1000m² or less in area, where both length and width exceed the building height and site is unaffected by land topography.

CapacityPLUS™ 660 CLADDING - MAXIMUM SPAN CHART (mm)

	roofs - all areas unless noted *					walls					overhangs	
bmt (mm)	pressure (kPa)					pressure (kPa)						
	service-ability	strength	double spans	equal spans	internal (end) span combination	service-ability	strength	double spans	equal spans	internal (end) span combination	free edge	stiffened edge
N1 or Region A (TC3, FS) Wind Classification												
0.42	0.74	1.25	2800*	2800	3400 (2700)*	0.55	0.94	4200	4500	4500 (3600)	250	600
	1.07	1.81	2550		3100 (2450)							
0.48	0.74	1.25	3400*	3400	4000 (3200)*	0.55	0.94	4500	4500	4500 (3600)	300	650
	1.07	1.81	3100		3650 (2900)							
N2 or Region B (TC3, FS) or Region A (TC2.5, PS) Wind Classification												
0.42	1.05	1.75	2600*	2800*	3150 (2500)*	0.79	1.31	3350	3600	3800 (3000)	250	600
	1.53	2.53	1900	2200	2300 (1800)							
0.48	1.05	1.75	3200*	3400*	3700 (2950)*	0.79	1.31	3850	4150	4300 (3400)	300	650
	1.53	2.53	2250	2600	2850 (2250)							
N3 or Region B (TC2.5, PS) or Region A (TC2, NS) Wind Classification												
0.42	1.32	2.70	1650*	2050*	2200 (1750)*	0.99	2.03	2300	2550	2800 (2200)	250	300
	1.92	3.92	1000	1150	1250 (1000)							
0.48	1.32	2.70	2100*	2450*	2700 (2150)*	0.99	2.03	2850	3150	3350 (2650)	300	400
	1.92	3.92	1250	1450	1650 (1300)							

* Where roof pitch is less than 10 degrees, use spans given in red for roof corners.
Internal spans must have both end spans 20% shorter. TC - Terrain category. FS, PS, NS - Full, partial and no shielding. Internal pressure coefficient +0.2/-0.3.
Values are only valid for use with steel members of 1.5mm or thicker. Where thinner supports are used, fastener capacity must be checked. Refer to Stramit® Top Hat & Battens Product Technical Manual for more information.
For more specific applications CapacityPlus™ 660 cladding must be designed to the pressure and foot traffic limitations below and on the next page. Roof spans may exceed those shown in this table, provided the wind pressure and foot traffic limits are not exceeded.

PRESSURES

CapacityPLUS™ 660 CLADDING - SERVICEABILITY LIMIT STATE CAPACITY

thickness bmt (mm)	fasteners per sheet at each support	span type	*pressure (kPa) at the spans (mm) shown*													
			600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500
0.42	3	internal	4.66	3.95	3.34	2.82	2.37	1.98	1.67	1.41	1.19	1.01	0.87	0.77	0.69	0.64
		equal	4.24	3.59	3.04	2.56	2.15	1.80	1.52	1.28	1.08	0.92	0.79	0.70	0.63	0.58
		double	3.73	3.16	2.68	2.25	1.89	1.58	1.34	1.13	0.95	0.81	0.70	0.62	0.55	0.51
0.48	3	internal	7.69	5.56	4.24	3.48	3.04	2.50	2.07	1.73	1.46	1.27	1.10	0.97	0.85	0.72
		equal	6.99	5.05	3.85	3.16	2.76	2.27	1.88	1.57	1.33	1.15	1.00	0.88	0.77	0.65
		double	6.15	4.44	3.39	2.78	2.43	2.00	1.65	1.38	1.17	1.01	0.88	0.77	0.68	0.57

CapacityPLUS™ 660 CLADDING - STRENGTH LIMIT STATE CAPACITY (Non-cyclonic)

thickness bmt (mm)	fasteners per sheet at each support	span type	*pressure (kPa) at the spans (mm) shown*													
			600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500
0.42	3	internal	8.86	5.64	4.15	3.55	3.27	2.94	2.41	2.13	1.89	1.68	1.52	1.39	1.29	1.23
		equal	8.05	5.13	3.77	3.23	2.97	2.67	2.19	1.94	1.72	1.53	1.38	1.26	1.17	1.12
		double	7.08	4.51	3.32	2.84	2.61	2.35	1.93	1.71	1.51	1.35	1.21	1.11	1.03	0.99
0.48	3	internal	9.21	6.68	5.18	4.30	3.76	3.38	3.05	2.73	2.40	2.11	1.88	1.73	1.64	1.56
		equal	8.37	6.07	4.71	3.91	3.42	3.07	2.77	2.48	2.18	1.92	1.71	1.57	1.49	1.42
		double	7.37	5.34	4.14	3.44	3.01	2.70	2.44	2.18	1.92	1.69	1.50	1.38	1.31	1.25

Tables are based on testing to AS1562.1 and AS4040 parts 0 and 2. Internal spans must have both end spans 20% shorter.
Values only valid for use with steel support members of 1.5mm or thicker. Where thinner supports are used, fastener capacity much be checked.
Refer to Stramit® Cyclonic Areas Roof and Wall Cladding Brochure for information on use in Cyclonic Regions.

FOOT TRAFFIC

Foot traffic limits for CapacityPLUS™ 660 cladding are shown for three alternate foot traffic categories.

These are:

- High Maintenance – for applications with repeated maintenance, particularly where personnel may be unfamiliar with correct procedures for walking on metal roofs.
- Normal – based on traditional expectations, with moderate maintenance foot traffic using designated foot paths.
- Controlled – spans that conform to AS1562.1 with 1.1kN load specified in AS/NZS1170.1 for R2 – Other Roofs. These require minimal careful foot traffic only on the designated foot path. Suggested for use only where occasional aesthetic imperfections from foot traffic are acceptable.

Tables are based on tests to AS1562.1 and AS4040 parts 0 and 1.

CapacityPLUS™ 660 CLADDING - FOOT TRAFFIC LIMITED SPANS (mm)

thickness bmt	span type	foot traffic limits		
		heavy	normal	controlled
0.42	internal	1200	3400	3400
	equal	1000	2800	3000
	double	1000	2800	3000
0.48	internal	1500	4000	4000
	equal	1300	3400	3400
	double	1300	3400	3400

For more information on foot traffic performance of other Stramit® roofing profiles refer to Stramit's Foot Traffic Guide.

SPRING CURVING

CapacityPLUS™ 660 cladding may be gently spring-curved, concave and convex, including curved ridges, provided it is sealed at the apex and within recommended limits. These limits are yet to be determined.

For more information on spring curving CapacityPLUS™ 660 cladding contact your nearest Stramit office.

THERMAL EXPANSION

All metal roof sheeting is subject to thermal expansion and, where there is a temperature difference between the sheeting and the structure, this needs to be accommodated.

The colour of the sheeting will affect the amount of thermal expansion, and whether the sheet is flat or curved will affect its ability to resist without problems. Sheet lengths should be limited to those shown below.

CapacityPLUS™ 660 CLADDING - THERMAL EXPANSION TABLE MAXIMUM SHEET LENGTH (m)

roof colour	light steel	dark steel
flat	25	17
spring-curved	20	17

The maximum length of sheeting can be extended through the use of special caps with slotted ribs.

WATER CARRYING

CapacityPLUS™ 660 cladding has excellent water-carrying capacity enabling roof slopes to be as low as 1° for many applications. Roof run lengths are the combined lengths of all roof elements contributing to a single pan drainage path. This can include the roof length upstream of a roof penetration that concentrates flow into other pans. The table below gives slopes for 100-year return period rainfall intensity.

Values are given for normal roof drainage applications, where the minimum slopes are calculated as for other Stramit® roofing profiles.

CapacityPLUS™ 660 CLADDING - MINIMUM ROOF SLOPE (degrees)

rainfall intensity mm/hr	total roof run length (m)											max roof run length (m) at min slope
	100	110	120	130	140	150	160	170	180	190	200	
150											1.0	305
175											1.0	262
200											1.0	229
225		*Minimum*								1.0	1.0	203
250		*Slope 1°*						1.0	1.0	1.2	1.4	183
275							1.0	1.1	1.3	1.5	1.8	166
300						1.0	1.2	1.4	1.7	2.0	2.3	152
325					1.0	1.3	1.5	1.8	2.1	2.5	2.8	141
350				1.0	1.3	1.6	1.9	2.2	2.6	3.0	3.4	131
375			1.0	1.3	1.6	1.9	2.3	2.7	3.1	3.6	4.0	122
400	1.0	1.0	1.2	1.5	1.9	2.3	2.7	3.2	3.7	4.2	4.7	114

Based on AS1562.1

For more information on water carrying performance of CapacityPLUS™ 660 cladding and other Stramit roofing profiles refer to Stramit's Roof Slope Guide.

CYCLONIC AREAS

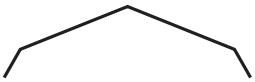
Cyclonic data for CapacityPLUS™ roofing can be found in the Stramit Cyclonic Areas Guide.

PROCUREMENT

PRICES

Prices on CapacityPLUS™ 660 cladding and its accessories can be obtained from your nearest Stramit location or distributor of Stramit® products. As Stramit does not provide an installation service, ask your tradesperson for a supply and fix price. Contact your nearest Stramit location for the names of tradespersons in your area.

RELATED PRODUCTS



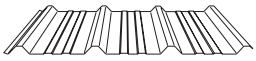
Ridge Capping – standard or custom dimensions

Flashings – a range of custom flashings

Filler Strips – top and bottom; for eaves, ridge and joint sealing

Use only where sealing is preferred to ventilation

Insulation & roofing mesh – a range of mesh, Sisalation®, plain & foil backed blanket



Translucent sheeting – fibreglass sheeting in a range of shades and densities

LENGTH

CapacityPLUS™ 660 cladding is supplied cut-to-length. When designing or transporting long products ensure that the length is within the limit of the local Transport Authority regulations. The manufacturing tolerance on the length of product supplied is +0, -15mm.

ORDERING

CapacityPLUS™ 660 cladding can be ordered directly, through distributors, or supplied and fixed from a roofing contractor.

DELIVERY/UNLOADING

Delivery can normally be made within 48 hours, subject to the delivery location, quantity and material availability, or can be at a pre-arranged date and time. Please ensure that suitable arrangements have been made for truck unloading, as this is the responsibility of the receiver. Pack mass may be up to one tonne. When lifting CapacityPLUS™ 660 cladding, care should be taken to ensure that the load is spread to prevent damage.

HANDLING/STORAGE

CapacityPLUS™ 660 cladding should be handled with care at all times to preserve the product capabilities and quality of the finish. Packs should always be kept dry and stored above ground level while on site. If the sheets have become wet, they should be separated, wiped and placed in the open to promote drying.

INSTALLATION

SITE INDUCTION

Consideration should be given to roof and wall handling and installation issues as part of site induction safety procedures. Specific consideration should be given to pack handling, avoidance of cuts, trips, slips and falls, long sheet handling particularly in windy conditions, sheet cutting procedures and surface temperature on sunny days.

FASTENERS

All fastening screws must conform to AS3566 – Class 3 or better. They are to be hexagon headed and, for roofs, must be used with sealing washers. For connecting to purlins or top hats in non-cyclonic regions use:

For steel (1.5mm or greater) – 12 x 80*mm self-drilling and threading screws for crest fixing

– 10 x 16mm self-drilling and threading screws for pan fixing to walls

For timber (F11 or better) – 12 x 95*mm type 17 screws for crest fixing

– 10 x 25mm type 17 screws for pan fixing to walls

Side Laps – 10 x 16 self drilling and threading screws, or

– 3.2mm diameter sealed aluminium pop rivets

Note*: Lengths shown are suitable for use with insulation blanket up to 50mm. For 75mm or 100mm insulation blanket increase screw length by at least 10mm.

INSULATION

CapacityPLUS™ 660 cladding is suitable as specified for use with insulating blanket up to 50mm. Increased thicknesses require longer fasteners and greater care in installation.

INSTALLATION

CapacityPLUS™ 660 cladding is readily installed with or without fibreglass insulation blanket. If practical lay sheets in the opposite direction to prevailing weather.

Installation of CapacityPLUS™ 660 cladding is a straightforward procedure using the following fixing sequence:

1) Ensure all purlins are in line and correctly installed and that mesh and blanket (if specified) are in place.
2) Position and fix the first sheet ensuring the correct sheet overhangs (minimum eave overhang 50mm). Ensure that screws are not over-tightened.
3) Continue to fix subsequent sheets checking that sheet ends at the lower edge are exactly aligned.

It is important that the underlap of one sheet does not protrude beyond the overlap of the next at the low end of the run - if this is unavoidable, the underlap must be trimmed locally or water 'drawback' may occur.

4) Measure the overall cover width at top and bottom of the sheets from time to time to avoid 'fanning'.
5) For roof spans exceeding 1500mm and wall spans exceeding 1800mm, stitch the sidelaps at midspan.
6) Turn up the pans at the upper roof edge and turn down the pans at the lower edge and install flashings. Fix flashing according to AS1562.1.
7) Clean up the roof after each days work, removing all screws, cuttings, swarf etc, and leave roof clean and watertight.

WALKING

As with all roofing products, we recommend extra caution be taken when walking on the roof. When walking on CapacityPLUS™ 660 roofing always wear flat rubber soled shoes and place feet only in the pans, taking care to avoid the last pan or two near edges of the metal roof area.

Walk only in pans, or on ribs at purlin supports.

GOOD PRACTICE

Stramit recommends that good trade practice be followed when using this product, such as that found in Australian Standards Handbook HB39.

CUTTING

CapacityPLUS™ 660 cladding can be easily cut, where required, using a power saw with a steel cutting blade or a power nibbler and, for localised cutting, tin snips. Avoid the use of abrasive discs as these can cause burred edges and coating damage. Please dispose of any off-cuts carefully.

ADDITIONAL INFORMATION

MAINTENANCE

Exterior surfaces of metal products unwashed by rain can benefit from occasional washing to remove build-up of corrosive salts. Walls beneath eaves or awnings are such a situation.

FURTHER INFORMATION

As well as our standard range of Technical Manuals, Installation Leaflets, Case Studies and other promotional literature Stramit has a series of Guides to aid design.

These include:

- Roof & Wall Flashing Guide
- Roof Slope Guide
- Foot Traffic Guide
- Concealed Fixed Decking
- Bullnosing, Curving and Crimping
- Acoustic Panels
- Cyclonic Areas
- Spring Curving Guide

Please contact your nearest Stramit location for any of these guides or other literature.

OTHER PRODUCTS

Stramit offers a wide range of building products, including:

- Purlins and girts
- Formwork decking
- Roof and wall sheeting
- Lightweight structural sections
- Truss components
- Gutters and downpipes
- Fascias
- Custom flashings
- Insulating products
- Fasteners

REFERENCES

In preparing this document reference has been made to:

- Standards Australia Handbook - HB39 (Installation code for metal roof and wall cladding)
- BlueScope Steel - Technical Bulletin TB-4 (Maintenance of Colorbond prepainted steel roofing)
- BlueScopeSteel - Technical Bulletin TB-1 (Steel roofing and walling products - selection guide)

CONTACT US

Visit **stramit.com.au** or contact us using the details below.

REGION	LOCATION	CONTACT DETAILS	TECHNICAL ENQUIRIES
NSW & ACT	SYDNEY 33-83 Quarry Rd, Erskine Park NSW 2759	Ph 02 9834 0909 Fax 02 9834 0988	Ph 02 9834 0964
	CANBERRA 4 Bass St, Queanbeyan NSW 2620	Ph 02 6298 2500 Fax 02 6298 2533	
	COFFS HARBOUR 6 Mansbridge Dr, Coffs Harbour NSW 2450	Ph 02 6656 3800 Fax 02 6656 3808	
	NEWCASTLE 17 Nelson Rd, Cardiff NSW 2285	Ph 02 4041 3400 Fax 02 4041 3423	
	ORANGE 51 Leewood Dr, Orange NSW 2800	Ph 02 6360 9200 Fax 02 6360 9211	
VIC	MELBOURNE 3/1464 Ferntree Gully Rd, Knoxfield VIC 3180	Ph 03 9237 6300 Fax 03 9237 6399	Ph 03 9237 6353
	ALBURY 18 Ariel Dr, Albury NSW 2640	Ph 02 6092 3700 Fax 02 6092 3766	
	BENDIGO Lot 7-9 Ramsay Court, Kangaroo Flat VIC 3555	Ph 03 5448 6400 Fax 03 5447 9677	
TAS	HOBART 57 Crooked Billett Dr, Brighton TAS 7030	Ph 03 6262 8788 Fax 03 6262 8712	Ph 03 9237 6353
SA	ADELAIDE 11 Stock Rd, Cavan SA 5094	Ph 08 8219 2000 Fax 08 8219 2021	Ph 03 9237 6353
SOUTH QLD	BRISBANE 57-71 Platinum St, Crestmead QLD 4132	Ph 07 3803 9999 Fax 07 3803 1499	Ph 07 3803 9869
	MARYBOROUGH 10 Activity St, Maryborough QLD 4650	Ph 07 4123 9500 Fax 07 4123 9508	
	ROCKHAMPTON 41 Johnson St, Parkhurst QLD 4702	Ph 07 4921 5600 Fax 07 4921 5608	
NORTH QLD	CAIRNS 53 Vickers St, Edmonton QLD 4869	Ph 07 4034 6555 Fax 07 4034 6511	Ph 07 3803 9869
	TOWNSVILLE 402-408 Bayswater Rd, Garbutt QLD 4814	Ph 07 4412 3900 Fax 07 4412 3909	
WA	PERTH 605-615 Bickley Rd, Maddington WA 6109	Ph 08 9493 8800 Fax 08 9493 8899	Ph 07 3803 9869