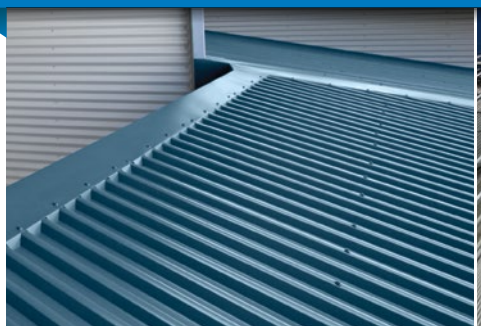
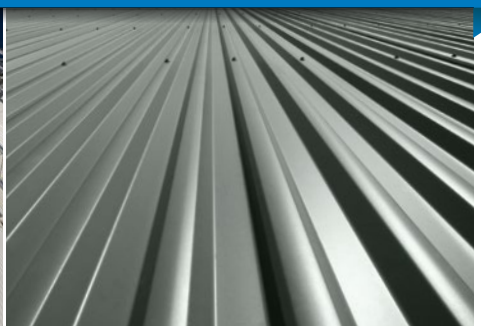
STRATCO

SMARTSPAN®

ROOFING AND WALLING

DESIGN GUIDE





SMARTSPAN

STRONG, BOLD, STYLISH ROOFING & WALLING

FORM AND FUNCTION

Strong, bold and stylish, Smartspan® has a 'square corrugated' form that provides an interesting blend of light and shade wherever it is placed. Smartspan has the looks and versatility to allow it to blend easily with any building style. Its strong nine rib design lends itself for use on roofing, walling and fencing. Smartspan is used on walkways, school buildings, or heavy duty walling in commercial and industrial applications. Smartspan is ideal for architects and builders who are trying to achieve a different look, with maximum serviceability.

Made from high tensile steel for strength and impact resistance, it is ideal for long length industrial uses. Smartspan can be used in continuous lengths, at low roof pitches with generous support spacings. This can provide a real cost saving on most projects. The 24mm high rib is strong and able to channel water quickly. It has a non-syphoning side lap which reduces the risk of moisture transfer between sheets due to capillary action, thus reducing the risk of roof leakage.

CUSTOM MADE FOR YOUR PROJECT

Smartspan sheets longer than 1.2 metres are rolled to the specific length you require, provided the appropriate transport and handling can be arranged. If lengths longer than ten metres are required, consult your nearest Stratco for advice on handling and transport.

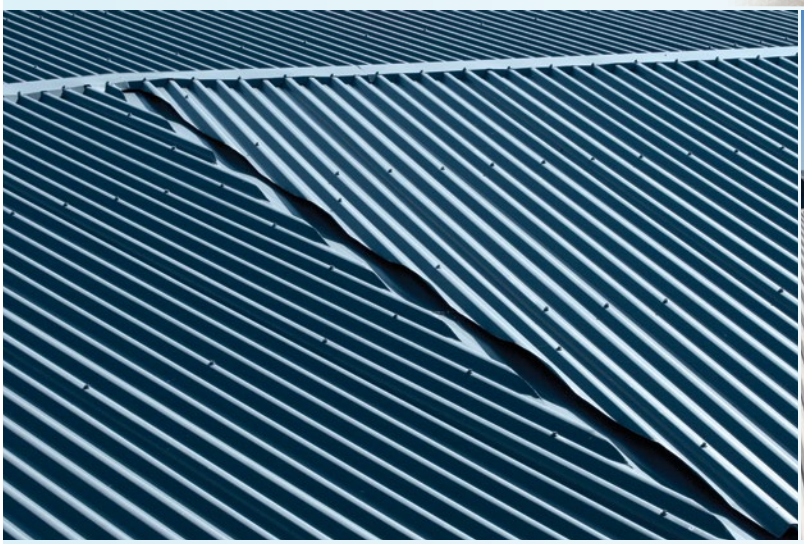
To give your roof a professional finish, painted self drilling screws are available. Stratco offer a complete range of flashings and accessories for use with Smartspan, and can provide professional advice on specific flashings.

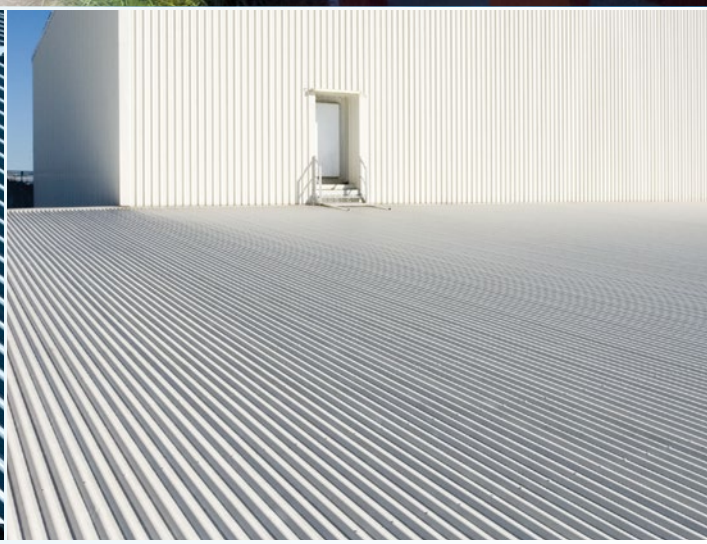
DESIGN CONSIDERATIONS

Smartspan has a 700mm coverage and the minimum recommended roof pitch is two degrees (1 in 30). Smartspan is subject to thermal expansion. Darker colours are affected more than light, and spring curved sheeting needs additional consideration. The maximum length before an expansion joint is needed is 24 metres for light colours, and 16 metres for dark colours. For spring curved sheeting it is 20 metres for light colours and 16 metres for dark colours.

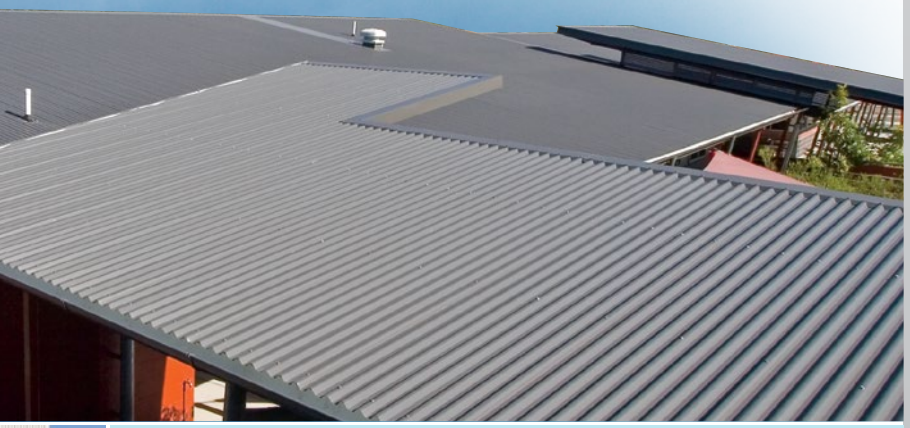
SPRING CURVING

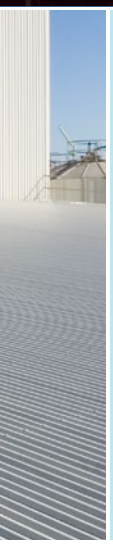
Smartspan may be spring curved using purlins at a maximum spacing of 1200mm for .42mm BMT and 1400mm for .48mm BMT. The curve must have a minimum radius of 20m for .42mm and .48mm BMT. The maximum radius is 60m to allow for sufficient drainage over a crest. The side laps must be sealed wherever the roof pitch is less than the recommended minimum.





"Strong and bold, Smartspan has the style and attributes to make it a modern classic."





MATERIAL SPECIFICATIONS

TABLE 1.0

Material Properties	Finish	0.42 BMT	0.48 BMT
Total Coated Thickness (TCT) mm	Zinc/al	0.47	0.53
	Colour	0.50	0.56
Mass (kg/linear metre)	Zinc/al	3.26	3.70
	Colour	3.32	3.76
Mass (kg/square metre)	Zinc/al	4.66	5.28
	Colour	4.74	5.37
Yield (square metre/tonne)	Zinc/al	214.6	189.4
	Colour	211.0	186.2
Tensile Strength (MPa)	Zinc/al & Colour	G550	G550
Width Coverage (mm)	Zinc/al & Colour	700	700
Sheet Tolerances (mm)	Length & Width	±5 ±2	±5 ±2
Minimum Roof Pitch	Zinc/al & Colour	2°	2°

COMPLIANCE

The Wind Capacity Tables are based on testing in accordance with AS1562.1-1992 and AS4040.0, 1 & 2-1992. Span tables have been developed by determining wind pressures in accordance with AS4055-2006 for domestic applications and AS/NZS 1170.2:2002 for all other applications. Capacity tables are in limit state format.

SPANS

Spans are determined by wind speeds for non-cyclonic areas. For domestic applications, the pressures and spans are based on a maximum: eaves height of six metres, roof pitch of 35 degrees and total roof height of 8.5 metres. For commercial and industrial applications, tables are based on a maximum overall height of ten metres and a 500 year design return period.

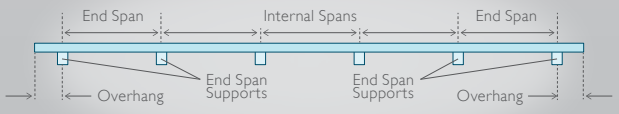
Roofing calculations are based on Cpe=-0.9 and Cpi=0.2, walling is based on Cpe=-0.65 and Cpi=0.2. A local pressure factor, Kl=2.0 has been used for all roofing and walling spans for both strength and serviceability limit states. Roof spans allow for loads incidental to maintenance.

All pressures have been determined assuming the wind loading in any direction is not affected by topography. The following shielding factors have been used for each of the terrain categories: Category 3 = 0.85, Category 2.5 = 0.95, and Category 2 = 1.

The carport and verandah spans only apply to structures not enclosed by peripheral walls. Spans are based on Cpn=-0.9 and Kl=1.5 applied over the entire span, and are suitable for all span types. Loads on supporting purlins may limit these spans.

Stratco can provide additional engineering advice if any design parameters vary from those above.

SPAN DEFINITIONS



WIND LOAD CONVERSION

For domestic applications use the appropriate wind classification for the area. To read the span tables for commercial and industrial applications, select the region and category for the area, then convert it to the correct classification using table 2.0 below.

TABLE 2.0 - WIND LOAD CONVERSION

Wind Classification (Domestic)	Region & Category (Commercial/Industrial)
N1 (W28)	Reg A, Cat 3
N2 (W33)	Reg A, Cat 2.5 - Reg B, Cat 3
N3 (W41)	Reg A, Cat 2 - Reg B, Cat 2.5
N4 (W50)	Reg B, Cat 2

TABLE 3.0 - MAXIMUM RECOMMENDED SPANS (mm)

Span Type	Roofing (BMT)		Walling (BMT)	
	0.42mm	0.48mm	0.42mm	0.48mm
Single Span	1350	2000	2550	2600
End Span	1800	2300	3200	3300
Internal Span	2400	3000	3500	3600
Un-stiffened Overhang	200	250	200	250
Stiffened Overhang	500	600	500	600

Roofing spans are limited, based on typical maintenance foot traffic. Walling spans are based on N1 (W28) wind loading.
All spans are based on four fasteners per sheet, per support.

TABLE 4.0 - DOMESTIC CARPORT / VERANDAH SPANS (mm)

Wind Classification	Base Metal Thickness	
	0.42mm	0.48mm
N1 (W28)	2500	2700
N2 (W33)	2500	2700
N3 (W41)	2100	2300
N4 (W50)	1800	2000

TABLE 5.0 - SPANS (mm)

BMT	Application	Span Type	THREE FASTENERS				FOUR FASTENERS			
			N1 (W28)	N2 (W33)	N3 (W41)	N4 (W50)	N1 (W28)	N2 (W33)	N3 (W41)	N4 (W50)
0.42mm	Roofing	Single	1350	1350	1350	-	1350	1350	1350	1350
		End	1800	1800	1700	-	1800	1800	1800	1500
		Internal	2400	2000	1800	-	2400	2400	2250	1600
	Walling	Single	2300	1950	1750	1500	2550	2050	1900	1750
		End	3000	2300	1950	1550	3200	2650	2150	1800
		Internal	3300	2500	2000	1750	3500	3100	2750	1950
0.48mm	Roofing	Single	2000	1850	1500	-	2000	2000	1800	1700
		End	2300	2100	1800	-	2300	2300	2100	1750
		Internal	3000	2350	2000	-	3000	2850	2350	2000
	Walling	Single	2350	2100	1850	1750	2600	2250	2050	1950
		End	3000	2350	2100	1850	3300	2700	2300	2150
		Internal	3400	2950	2350	1950	3600	3300	2850	2400

TABLE 6.0 - WIND CAPACITIES (kPa)

BMT	Span Type	Limit State	SPAN (mm) - THREE FASTENERS										SPAN (mm) - FOUR FASTENERS									
			1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900
0.42mm	Single	Serviceability	2.09	1.64	1.18	0.73	0.58	0.43	-	-	-	-	2.73	2.12	1.52	0.91	0.71	0.51	-	-	-	-
		Strength	4.74	4.30	3.87	3.43	3.07	2.71	-	-	-	-	6.06	5.34	4.62	3.90	3.50	3.11	-	-	-	-
	End	Serviceability	2.41	1.97	1.52	1.08	0.93	0.79	0.64	0.49	0.35	-	3.36	2.67	1.97	1.27	1.09	0.91	0.73	0.55	0.36	-
		Strength	3.95	3.44	2.92	2.40	2.16	1.92	1.67	1.43	1.19	-	5.27	4.51	3.76	3.00	2.74	2.48	2.22	1.96	1.70	-
	Internal	Serviceability	2.82	2.24	1.67	1.09	0.98	0.87	0.75	0.64	0.53	-	4.27	3.44	2.61	1.77	1.52	1.27	1.03	0.78	0.53	-
		Strength	4.96	4.09	3.22	2.35	2.13	1.91	1.69	1.47	1.25	-	5.55	4.78	4.00	3.23	2.95	2.67	2.40	2.12	1.84	-
0.48mm	Single	Serviceability	-	1.70	1.32	0.94	0.55	0.47	0.38	0.30	-	-	-	2.20	1.70	1.20	0.70	0.57	0.43	0.30	-	-
		Strength	-	4.75	4.21	3.67	3.13	2.74	2.34	1.95	-	-	-	6.10	5.53	4.95	4.38	3.86	3.33	2.81	-	-
	End	Serviceability	-	2.05	1.67	1.29	0.91	0.77	0.63	0.48	0.34	0.20	-	2.91	2.31	1.72	1.12	0.95	0.78	0.61	0.44	0.27
		Strength	-	4.01	3.48	2.96	2.44	2.13	1.83	1.52	1.22	0.91	-	5.10	4.44	3.78	3.12	2.78	2.45	2.12	1.79	1.46
	Internal	Serviceability	-	2.30	1.94	1.57	1.21	1.06	0.91	0.77	0.62	0.47	-	3.57	2.90	2.22	1.55	1.34	1.14	0.93	0.73	0.53
		Strength	-	4.33	3.72	3.11	2.49	2.18	1.87	1.56	1.24	0.93	-	5.67	4.96	4.26	3.55	3.15	2.74	2.33	1.92	1.51

The values in all of the above tables are for use with steel supports with a minimum thickness of 0.75mm, G550.

WATER CARRYING CAPACITY

TABLE 7.0 - MAXIMUM ROOF RUN FOR DRAINAGE (m)

PEAK RAINFALL INTENSITY

Roof Slope	150 mm/hr	180 mm/hr	200 mm/hr	250 mm/hr	300 mm/hr	350 mm/hr	400 mm/hr	450 mm/hr
2°	86	72	64	51	43	37	32	28
5°	137	114	102	82	68	58	51	45
7.5°	168	140	126	100	84	72	63	56
10°	194	162	145	116	97	83	73	64
15°	239	199	179	143	119	102	89	79
22°	294	245	220	176	147	126	110	98

The peak rainfall intensities shown represent a 100 year average recurrence interval (ARI) for a five minute rainfall duration. If roof penetrations exist, the total roof run will generally be greater than the distance from ridge to eaves at the location the penetration interferes with the runoff. Contact Stratco if further advice is required.

WALKING ON SMARTSPAN

When walking on Smartspan roofing, it is recommended you walk over the purlins to avoid any damage. Wear flat, rubber soled shoes and walk flat footed, spreading your weight over as many crests as possible. For carport and verandah applications, crawl boards should be used to avoid damage during installation and maintenance.

ORDERING

Sheets are available custom cut, allowing you to minimise waste, and enhance your design options. Smartspan is available in unpainted zinc/al, and in an attractive range of factory pre-painted colours. Subject to the delivery location, quantity and material availability, delivery is usually within 48 hours, or at an agreed time that suits your building schedule. Unless advised differently, a one tonne maximum is usually applied to larger packs. Arrangements for unloading the truck are the responsibility of the customer, and should be arranged before ordering. When unloading you must ensure the load is adequately spread using spreaders and slings to prevent damage. If packs are to be loaded directly above structural members, they must be of sufficient strength, such as over portal frames, or braced roof trusses.

USING SMARTSPAN

Stratco Smartspan will have a long, useful life if used according to Stratco specifications. While roofing materials in outer urban and rural areas may have a life-span in excess of 30 years, this can reduce to only a few years in coastal and industrial environments.

Zinc/al and pre-painted steel should not be used in very aggressive areas such as near swimming pools and spas. It is important that dirt, soil, compost, paving sand, or other materials which retain moisture are not placed against steel sheeting. Concrete should not be poured against zinc/al material. Check with Stratco before using in these severe environments.

INCOMPATIBLE METALS

The best way of reducing corrosion is to keep incompatible metals apart. Zinc/al and pre-painted steel cannot be used with lead, copper and monel. Galvanised steel and pure zinc material can be used with zinc/al, but you must avoid water run-off from zinc/al onto galvanised material. Fixings such as rivets and self-drilling screws must be compatible with the material they are fixing.

HANDLING AND CUTTING OF SMARTSPAN

For safety, wear gloves when handling Smartspan. Ensure your hands or gloves are clean, especially when handling zinc/al which can mark. Use a coloured pencil for marking steel, as lead or black pencils contain graphite which promotes rusting. Smartspan is best cut using tin snips, but for larger cuts it may be necessary to use a power saw with a steel cutting blade or a power nibbler. Avoid using abrasive discs as they can cause burred edges and coating damage. Where possible cut sheets on the ground, and always clean off any swarf and metal filings progressively during the installation. Dispose of off-cuts carefully.

INSULATION AND SEALANTS

The use of blanket insulation is recommended in domestic roofing to assist in temperature, condensation and sound control. Smartspan can be used with an insulating blanket up to 55mm thick. Increased thicknesses require longer fasteners and greater care when installing.

When choosing a silicone sealant, ensure it is suitable for roofing and guttering use and of a non-acetic, amine free, neutral cure type. Sealants that smell of ammonia, vinegar or lemons are not usually suitable.

MAINTENANCE REQUIREMENTS

The performance of Smartspan over time depends on its correct application and maintenance. Maintenance should be performed as often as is required to remove any dirt, salt and pollutants. Where used in severely corrosive environments, cleaning should be performed more often. It is important that screws have the same life expectancy as the cladding you have specified.

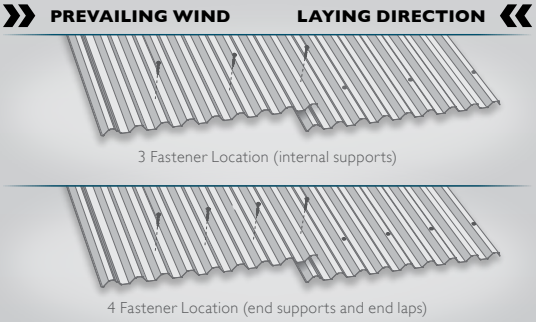
Packs of Smartspan should always be kept dry and stored above ground level while on site. If the sheets have become wet, they should be separated, wiped and placed in the open to dry.

Refer to the Stratco 'Selection, Use and Maintenance' brochure, for more detailed information about the correct use and maintenance of this product.

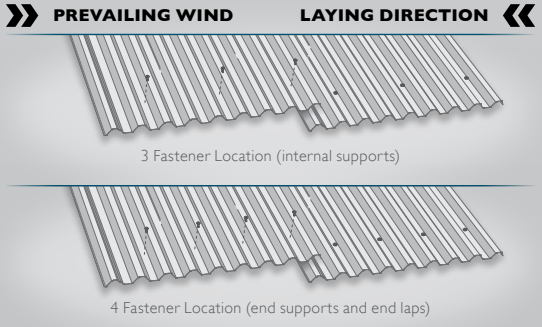
FIXING RECOMMENDATIONS

Smartspan sheets should be laid into the prevailing wind and sit neatly on the preceding roof sheet, as shown in the laying procedure below. They should be fixed within the recommended support spacings. Avoid 'stretching' the width of the sheet when installing, as this could allow wind and rain to enter. If the spans exceed 900mm for roofing or 1200mm for walling, it is recommended that side lap fasteners are used at mid-span. Side lap fixing will help maintain a weather proof seal and will secure the overlap especially when the roof is walked on occasionally. This is best done with either 8 x 12mm self drilling stitching screws or a 3.2mm blind rivet (rivets should be sealed to prevent water penetration). On roofing, at the end of the sheets, the valleys of each corrugation should be turned up at crest of the roof and down into the gutter using a turn up/down tool.

ROOFING LAYING PROCEDURE



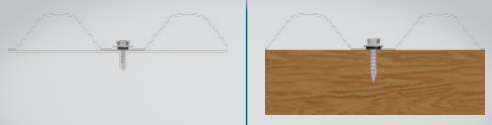
WALLING LAYING PROCEDURE



FASTENER SIZE SELECTION

WALLING - PAN FIXING

All screws must have a neoprene washer for a weather tight seal

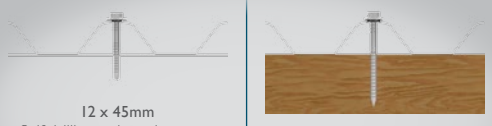


10 x 16mm
Self drilling and tapping screw with neoprene washer

10 x 25mm
Type 17 hex head screw with neoprene washer

ROOFING - CREST FIXING

All screws must have a neoprene washer for a weather tight seal



12 x 45mm
Self drilling and tapping screw
or
M6 x 50mm
TS self drilling screw
(For 0.55mm thick battens use M6 x 50 TS self drilling screws)

12 x 65mm
Type 17 hex head screw
or
M6 x 65mm
TS self drilling screw

The above fastener sizes are suitable for fixing over an insulation blanket up to 55mm thick, for thicknesses up to 100mm, the next standard screw length to that indicated is to be used.

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STRATCO

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