Superior Aesthetics, Environmentally Sustainable.

UniSon

KAWA®

Ultimate Cover

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KAWA
KZ STANDING SEAM SERIES

KAWA
NS STANDING SEAM SERIES

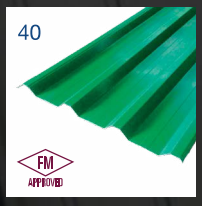
KAWA
R500 LOCKSEAM

KAWA
R650 LOCKSEAM

KAWA
R600

KAWA
R670

KAWA
R700



KAWA
R715

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R760

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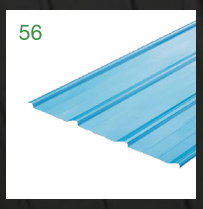
HOMAGE



KAWA
R805

GROUP'S
OVERSEAS PROJECTS





COMPANY **BACKGROUND**

United Seasons Sdn Bhd (Unison®) is principally engaged in the manufacture of quality steel KAWA roof and wall cladding systems.

The Roofing Specialist

For more than 20 years, **Unison®** has prided itself on being more than just experts in the design, manufacture and installation of quality steel roof and wall cladding.

In our pursuit of building excellence, **Unison®** is committed to contributing to a greener environment. Our **KAWA** range of products conserve energy and is environmentally sustainable. We ensure our roof systems are designed for the right temperature control for the comfort of building interiors, resulting in energy conservation and cost savings. Raw materials are optimally used with little wastage, recyclable and have minimal impact on the environment, making it sustainable.

All **KAWA** products are manufactured under strict processes governed by ISO 9001:2008 Quality Management System. With this standard, **Unison®** is fully committed towards achieving defect free performance by complying with all requirements for total customer satisfaction.

Committed to Service Delivery

With decades of industry experience, **Unison®** is well positioned in providing clients with roofing expertise in design, installation and technical support not only in the home market, but replicated across the Globe no matter what the challenges are.

Unison® leads the industry in innovation, having been the pioneer in developing the "moving rollforming" platform. This platform enables the production of uninhibited lengths of roofing sheets on roof level at site, thereby reducing double handling, quick installation and improved site safety. The others are its unique smooth curved standing seam and crimped curved roof profiles.

The expertise and experience of Unison® ensure that your buildings look good with world class finishing, and also meets optimal standards in functionality and performance, ensuring environment sustainability.

KAWA KZ
Standing Seam Series

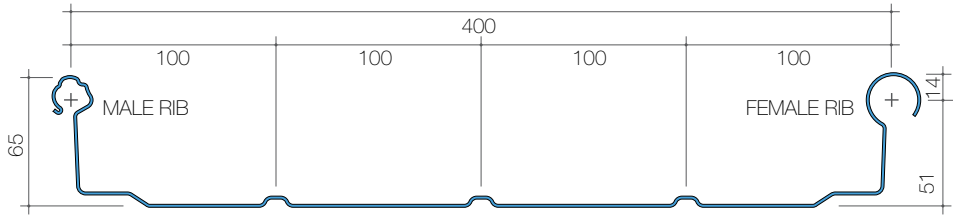
KAWA KZ Standing Seam Series

The **KAWA** KZ Standing Seam Series is a standing seam concealed roof fixing system. It can be uniquely rollformed by a proprietary process to precisely taper to exact angles and dimensions in a single pass. Each sidelap is locked and seamed by a robotic seamer against strong winds and heavy rains. The wide tray design disperses water efficiently from the roof surface, even at a minimum roof pitch of 1 degree. Widths of 300 mm, 400 mm, 500 mm and 600 mm are available.

ADVANTAGES

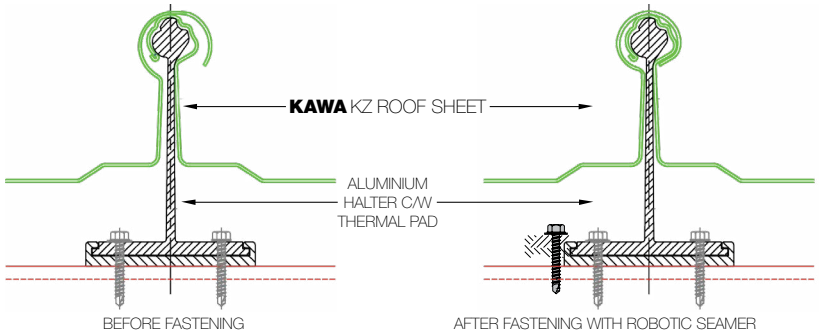
- It is a non-puncturing boltless roof system.
- The unique lock and seam fastening ensures a 100% watertight roof.
- It is light in weight but yet strong.
- The system allows for quick and efficient installation.
- Allows the construction of engineered built-up system for maximum heat and sound insulation.
- Extremely durable against corrosion because of the usage of materials like COLORBOND® steel, aluminium, copper and stainless steel.
- Engineered to precisely taper in a single pass. Speeds up work and eliminates frequently encountered errors in the normally used antiquated multiple pass process.

SECTION VIEW

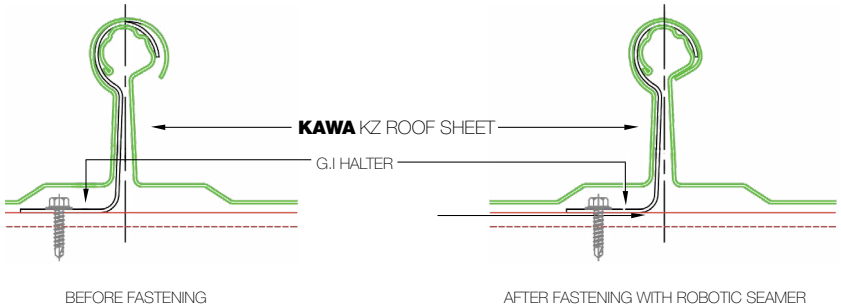


SIDE LAP

OPTION 1: ALUMINIUM HALTER



OPTION 2: STEEL CLIP



KAWA KZ Standing Seam Series
Specification

DIMENSIONS	
Overall Width (mm)	Nominal 322, 422, 522, 622
Effective Cover Width (mm)	Nominal 300, 400, 500, 600
Rib Height (mm)	Nominal 65

MATERIALS	Steel		Aluminium			
Base Steel Thickness (BST), (mm)	**0.48**	**0.60**	**0.80**	**0.90**	**1.00**	**1.20**

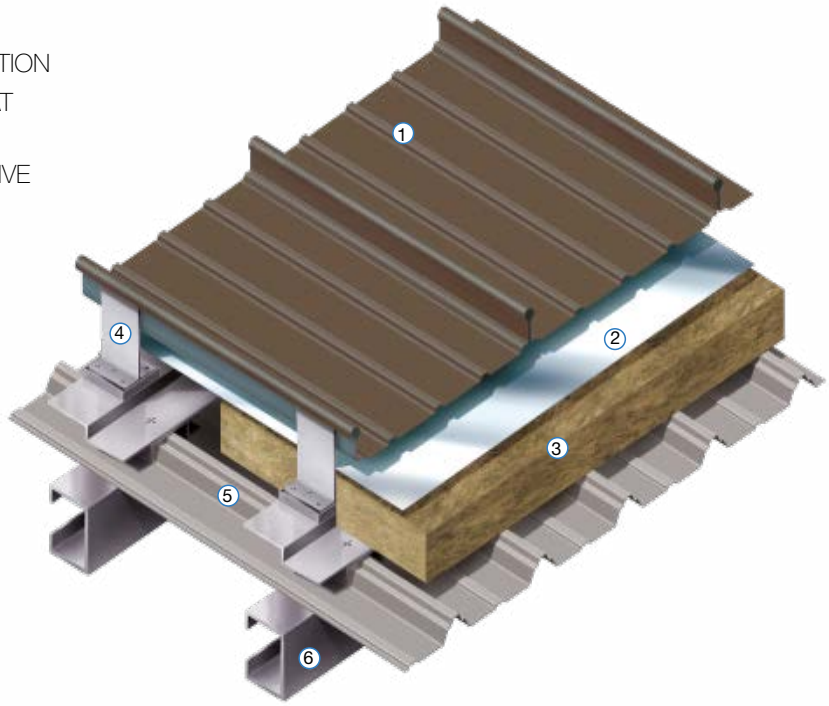
PROFILE WEIGHT						
Mass per Unit Area (kg/m²) for:						
KAWA KZ300	6.31	7.82	3.49	3.93	4.36	5.24
KAWA KZ400	5.71	7.08	3.16	3.55	3.95	4.74
KAWA KZ500	5.35	6.64	2.96	3.33	3.70	4.44
KAWA KZ600	5.11	6.34	2.83	3.18	3.54	4.24

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA KZ STANDING SEAM							
Span (m)							
0.9	Safe Load (kg/m²)	-	-	1096	1233	1370	1644
	Deflection for Above Load (mm)	-	-	1	1	1	1
1.2	Safe Load (kg/m²)	509	636	616	693	771	925
	Deflection for Above Load (mm)	1	1	3	3	3	3
1.5	Safe Load (kg/m²)	325	407	395	444	493	592
	Deflection for Above Load (mm)	2	2	4	4	4	4
1.8	Safe Load (kg/m²)	226	283	274	308	342	411
	Deflection for Above Load (mm)	3	3	6	6	6	6
2.1	Safe Load (kg/m²)	116	208	201	226	252	302
	Deflection for Above Load (mm)	4	4	8	8	8	8
2.4	Safe Load (kg/m²)	127	159	154	173	193	231
	Deflection for Above Load (mm)	5	5	10	10	10	10
2.7	Safe Load (kg/m²)	100	126	122	137	152	183
	Deflection for Above Load (mm)	5	6	13	13	13	13
3.0	Safe Load (kg/m²)	81	102	99	111	123	148
	Deflection for Above Load (mm)	8	8	16	16	16	16
3.5	Safe Load (kg/m²)	60	75	72	82	91	109
	Deflection for Above Load (mm)	10	10	22	22	22	22
4.0	Safe Load (kg/m²)	46	57	55	62	69	83
	Deflection for Above Load (mm)	13	13	29	29	29	29
4.5	Safe Load (kg/m²)	36	45	-	-	-	-
	Deflection for Above Load (mm)	17	17	-	-	-	-
5.0	Safe Load (kg/m²)	29	37	-	-	-	-
	Deflection for Above Load (mm)	21	21	-	-	-	-

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA KZ STANDING SEAM						
Roof Application						
Single Span (mm)	1550	1700	1450	1500	1550	1600
End Span (mm)	1550	1700	1650	1700	1800	1850
Internal Span (mm)	1900	2100	1950	2000	2100	2200
Free Cantilever (mm)	200	300	300	350	400	450

KAWA KZ Standing Seam Series
Built Up Roof Construction

1. **KAWA** KZ IN COLORBOND® STEEL
2. ALUMINIUM FOIL FOR SUPERIOR HEAT REFLECTION
3. ROCKWOOL INSULATION FOR EXCELLENT HEAT AND SOUND INSULATION
4. **KAWA** HALTER AND THERMAL PAD FOR POSITIVE LOCK SEAMING AND AS THERMAL BREAK
5. **KAWA** R760 INNER LINER ENHANCES ROOF RIGIDITY AND STABILITY
6. PURLIN



Roof Pitch

The **KAWA** KZ Standing Seam Series profile can be installed on a roof pitch as low as 1˚, making it virtually flat. However, it is recommended that a roof pitch of 2˚ be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

End Laps

Where end laps are inevitable, have a minimum of 250 mm end lap for a 5˚ roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5˚. Ensure water tightness by applying a good sealant to the end lap.

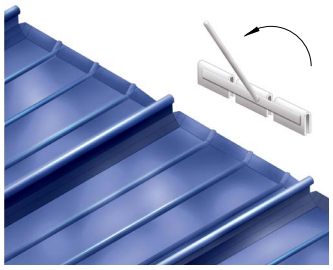


Fig.1: Stop ending of **KAWA** KZ STANDING SEAM

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done by a turn-up tool, turning up the tray between crests at the ridge end of the sheet (Fig.1). Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the eave end of the sheet (Fig.2). Lipping prevents water from being driven into the building by wind or capillary action. Both of these operations can be carried out before or after the installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5˚.

Fig.2: Lipping of **KAWA** KZ STANDING SEAM

KAWA KZ Standing Seam Series
Minimum Curvature Radius

STRAIGHT SHEET 400MM COVER WIDTH

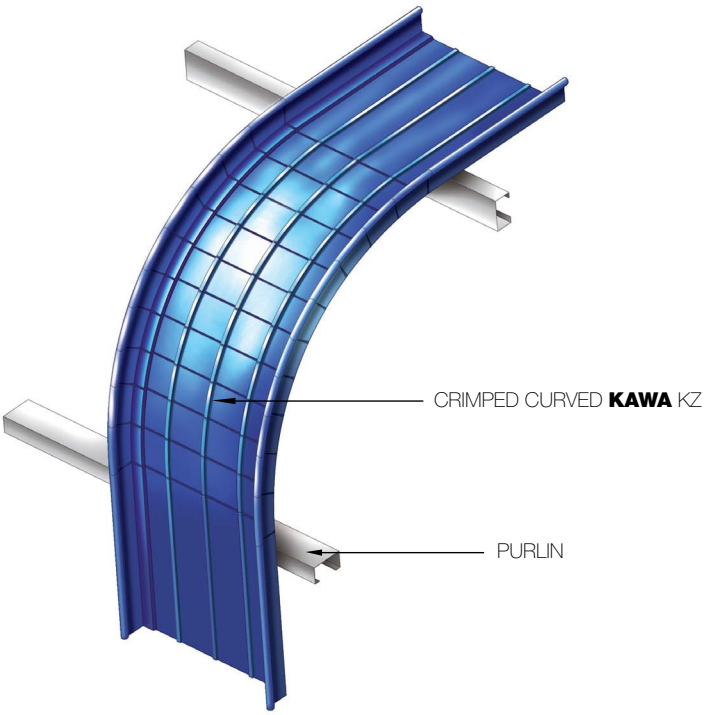
Material	Natural Curved (m)		Pre-Curved Smooth (m)		Crimped Curved (m)
Steel (mm)	Convex	Concave	Convex	Concave	Convex
0.48	90	98	20	35	0.60
0.60	90	98	10	25	0.60

TAPERED SHEETS

Material	Natural Curved (m)		Pre-Curved Smooth (m)	
Steel (mm)	Convex	Concave	Convex	Concave
0.48	90	98	30	N.A
0.60	90	98	25	N.A

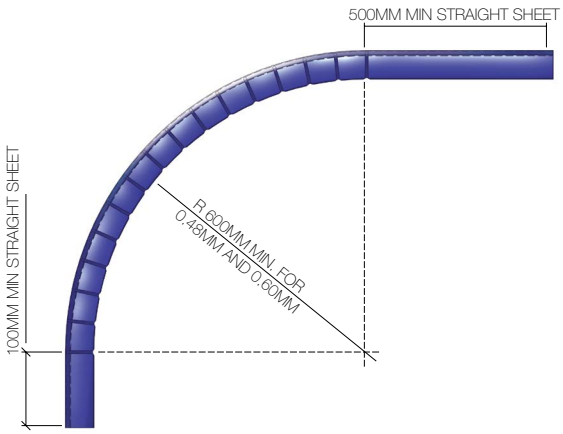
Note: information on aluminium material on request.

CRIMPED CURVED

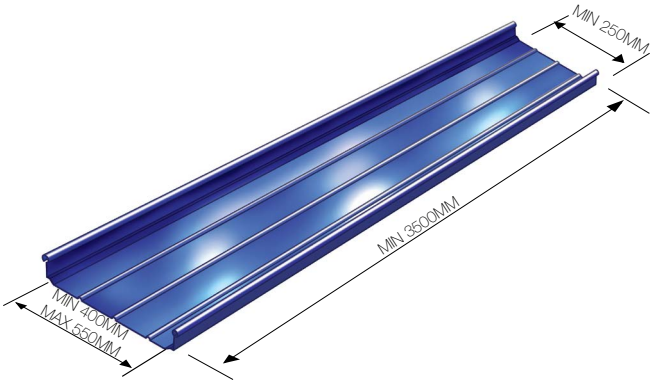


NATURAL CURVED

CRIMPED CURVED



TAPERED SHAPE



KAWA KZ Standing Seam Series
Projects Reference

KAWANS
Standing Seam Series

KAWA NS Standing Seam Series

The **KAWA** NS Standing Seam Series is a sophisticated roofing system based on the double lock seaming method of concealed fixing. The system includes a complete range of flashings, fixings and sealers that result in a roof of outstanding aesthetic proportions, reliability and durability.

TIMELESS ELEGANCE AND VERSATILITY

The **KAWA** NS is extremely versatile to suit most roof designs. The small corrugations are seen as uncluttered roof lines. The result is a roof that is aesthetically modern with a pleasing appearance.

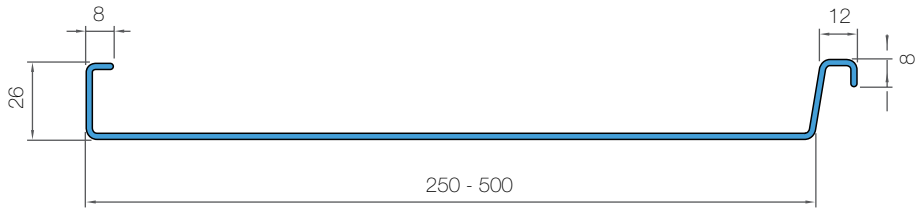
SUSTAINABLE & GREEN

KAWA NS non structural standing seam uses steel materials from NS Bluescope Malaysia Sdn. Bhd. The Steel is 100% recyclable, thereby making the product highly sustainable.

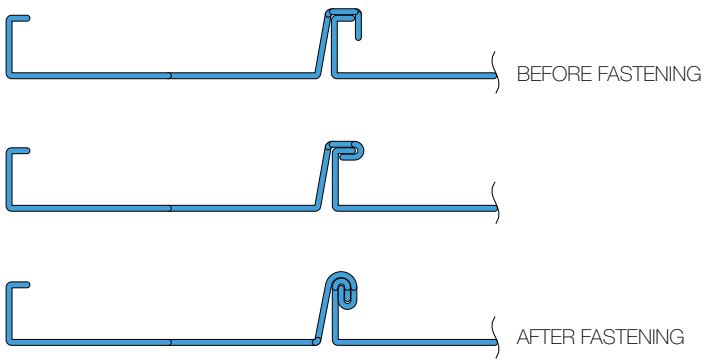
The use of **KAWA** NS for refurbishment work by installing over old roofing prevents tonnes of clay or cement roof tiles from ending up in landfills.

To crown it all, **KAWA** NS Standing Seam Series is made using BlueScope's COLORBOND® Steel Thermatech® with high Solar Reflectance of up to 85. This results in a roof with lower surface temperature and cooler interior.

SECTION VIEW



SIDE LAP



KAWA NS Standing Seam Series

WEATHER PROTECTION

Roof sheets are fastened onto the structure by means of hidden clips which can slide to allow for thermal expansion and contraction. There are no exposed penetrative fixings to blemish the clean surface of the roof expanse. The entire roof installation is watertight.

FLEXIBLE APPLICATION

Complex shapes are achievable with the ability of the **KAWA** NS to curve to small radii and taper from wide to narrow widths offering enhanced architectural appeal.

Tapered Sheets

With the **KAWA** NS ultra modern machine, tapered roof sheets can be roll formed. The result is long lengths of tapered roof sheets precisely engineered into an assembly of a splayed or "fan" roof design. With rolled tapered roof sheets, flashings & cappings are things of the past.

End Laps

Where end laps are inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure water tightness by applying a good sealant to the end lap.

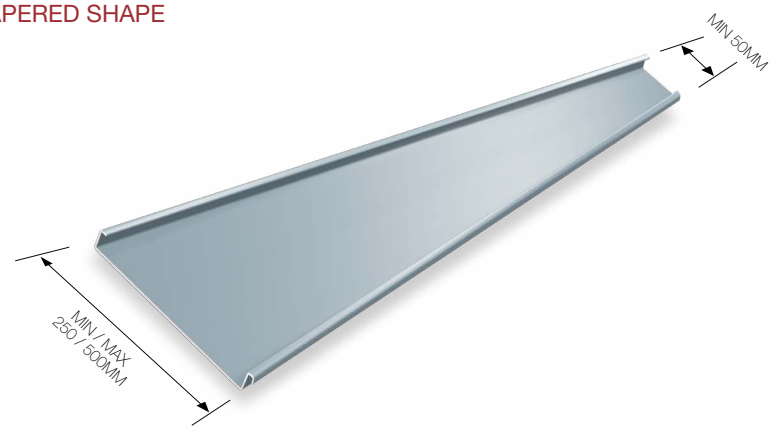
Roof Pitch

The **KAWA** NS Standing Seam Series profile can be installed on a roof pitch as low as 3°.

On Site Manufacture

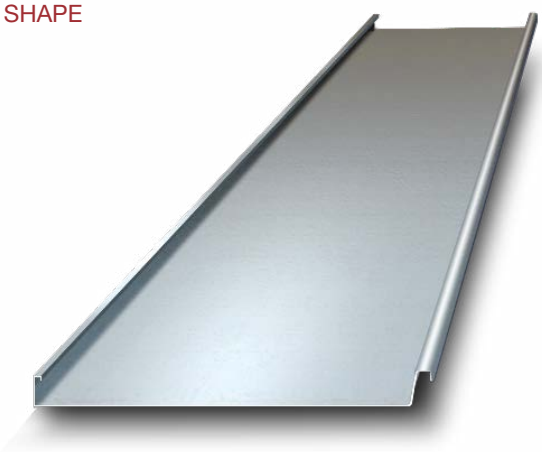
For Extra long lengths, the **KAWA** NS Standing Seam Series can be produced on site be it in the domestic or overseas markets. The roll former is transported to site in a specialised container for manufacture of roof panels to almost any length, either at ground or roof level. The result is the availability of economical & reliable long length roof sheets.

TAPERED SHAPE



SPLAYED OR FAN DESIGN

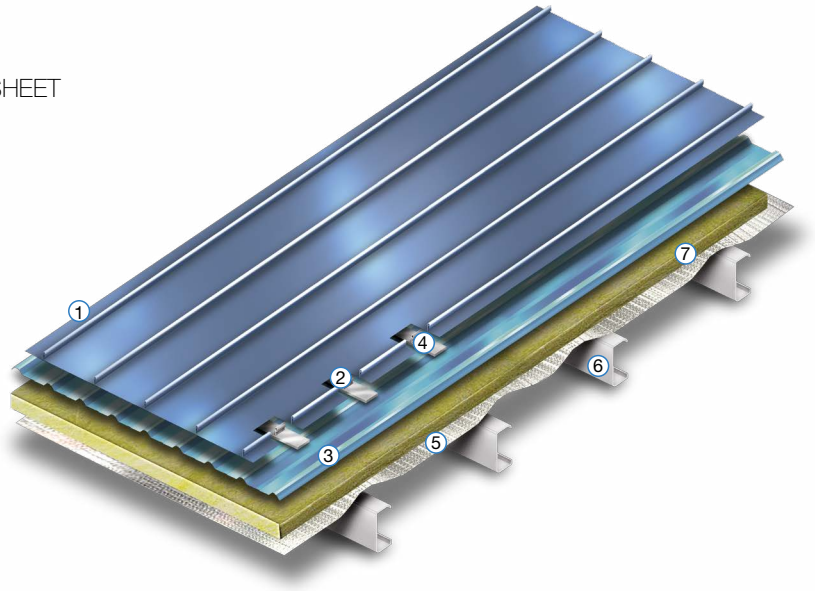
TAPERED SHAPE



NATURAL CURVED

KAWA NS Standing Seam Series
Built Up Roof Construction

1. **KAWA** NS STANDING SEAM METAL ROOFING SHEET
2. G.I. STRIP
3. METAL LINER
4. **KAWA** NS FIXING CLIP
5. WOVEN ALUMINIUM FOIL
6. PURLIN
7. MINERAL WOOL



Thermal and Sound Insulation

Specific thermal and sound insulation performance can be achieved by inter laying with various insulation materials such as mineral wool and others. Occupant comfort can be realised by optimising energy usage resulting in reduced cost.

A big advantage of the **KAWA** NS roof system is that it can accommodate varying depths of insulation depending on U-value requirements. Unlike other traditional roof fixing methods, the thickness of the mineral wool insulation is maintained consistently even over purlins. The continuous & homogenous insulation layer of a stonewool core without thermal bridges will give good lambda values.

Requirements of specific sound insulation and sound absorption levels in airport terminal buildings, concert & convention halls are achieved with the **KAWA** NS roof system. Various insulation materials such as stonewool and others can be incorporated into the roof system to reduce the sound transmission, and perforating the exposed surface on the underside of the assembly will improve its sound absorption properties.

Other attributes

LOW PITCH ROOF

The roof is watertight even on very gentle gradients and with good resistance to wind uplift.
The result is unlimited freedom for architects.

SMOOTH CURVES

To accentuate the beauty of the **KAWA** NS profile, smooth & soft curved lines are attainable for the roof. The flexibility and malleability of the product is demonstrated by allowing it to either curve naturally under its own weight (site sprung) or smooth curve it by use of a dedicated state of the art curving machine.

POSITIVE INSTALLATION

The **KAWA** NS Standing Seam Series is installed by the tried & tested principle of lockseaming the roof sheets together. A robotic seamer is employed for this work.

Note: Some waviness on light gauge flat metal surfaces will occur. This is due to steel mill tolerances and is a characteristic, not a defect of the panels. This phenomenon, referred to as oil canning, will not be accepted as a cause for rejection.

KAWA R500
Lockseam

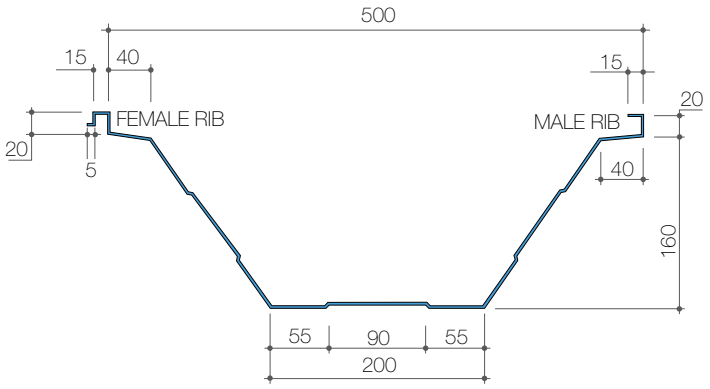
KAWA R500 Lockseam

The **KAWA** R500 Lockseam is the state-of-the-art trapezoidal roof concealed fixing system. The extremely deep corrugation coupled with its locked and seamed sidelap totally eliminates rainwater entry and any fear of wind uplift.

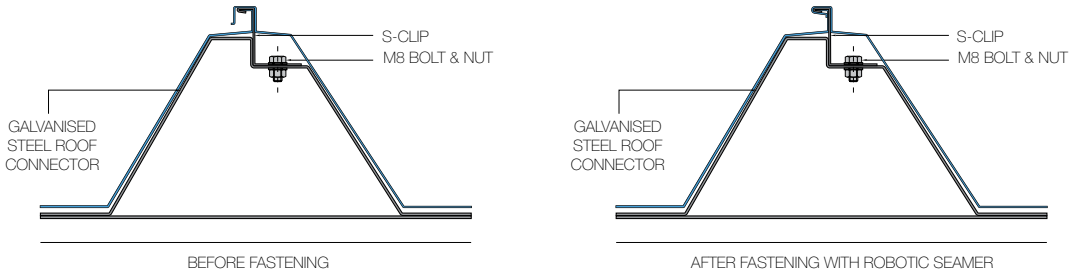
ADVANTAGES

- Non-piercing of the roof ensures 100% watertightness.
- A real roofing beauty. Its concealed fixing system results in a roof with clean, straight and rigid lines, uninterrupted by protruding screws or bolts.
- The unique lock and seam fastening process by a robotic seamer holds the roof sheets tightly against uplift or suction forces of strong winds.
- The profile's strikingly bold and deep corrugation makes it an extremely structurally strong roof requiring fewer purlins, an almost flat roof pitch with a small fascia, all of which contribute to substantial savings in building costs.

SECTION VIEW



SIDE LAP



KAWA R500 Lockseam Specification

DIMENSIONS						
Overall Width (mm)			Nominal 518			
Effective Cover Width (mm)			Nominal 500			
Rib Height (mm)			Nominal 180			

MATERIAL				Steel		
Base Steel Thickness (BST), (mm)		0.60	0.70	0.80	0.90	1.00

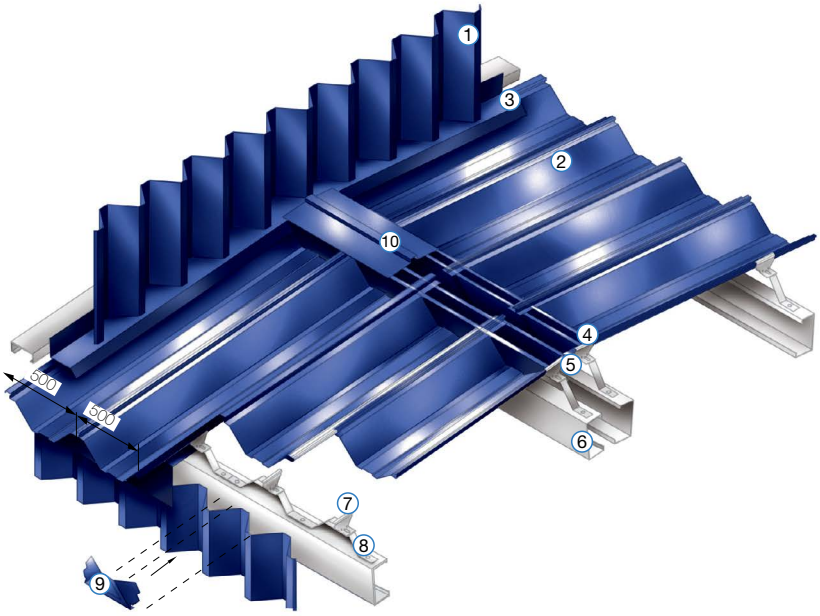
PROFILE WEIGHT						
Mass per Unit Area (kg/m²)		5.93	6.89	7.84	8.80	9.76
Mass per Unit Length (kg/m)		2.96	3.44	3.92	4.40	4.88
Area per Metric Tonne (m²/tonne)		168.66	145.20	127.48	113.61	102.46

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R500 LOCKSEAM						
Span (m)						
2.1	Safe Load (kg/m²)	1048	1222	1397	1572	1746
	Deflection for Above Load (mm)	2	2	2	2	2
2.4	Safe Load (kg/m²)	802	936	1070	1203	1337
	Deflection for Above Load (mm)	2	2	2	2	2
2.7	Safe Load (kg/m²)	634	739	845	951	1056
	Deflection for Above Load (mm)	3	3	3	3	3
3.0	Safe Load (kg/m²)	513	599	685	770	856
	Deflection for Above Load (mm)	4	4	4	4	4
3.5	Safe Load (kg/m²)	377	440	503	566	629
	Deflection for Above Load (mm)	5	5	5	5	5
4.0	Safe Load (kg/m²)	289	337	385	433	481
	Deflection for Above Load (mm)	6	6	6	6	6
4.5	Safe Load (kg/m²)	228	266	304	342	380
	Deflection for Above Load (mm)	8	8	8	8	8
5.0	Safe Load (kg/m²)	185	216	246	277	307
	Deflection for Above Load (mm)	10	10	10	10	10
5.5	Safe Load (kg/m²)	153	178	204	229	255
	Deflection for Above Load (mm)	12	12	12	12	12
6.0	Safe Load (kg/m²)	128	150	171	193	214
	Deflection for Above Load (mm)	14	14	14	14	14
6.5	Safe Load (kg/m²)	109	128	146	164	182
	Deflection for Above Load (mm)	17	17	17	17	17
7.0	Safe Load (kg/m²)	94	110	126	141	157
	Deflection for Above Load (mm)	20	20	20	20	20

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R500 LOCKSEAM					
Roof Application					
Single Span (mm)	4400	4600	4900	5200	5400
End Span (mm)	4600	4800	5100	5400	5600
Internal Span (mm)	5400	5600	6000	6300	6500
Free Cantilever (mm)	1000	1100	1200	1300	1400

KAWA R500 Lockseam For Roof & Wall Cladding

1. **KAWA** R600 WALL CLADDING
2. **KAWA** R500 LOCKSEAM ROOF SHEET
3. FLASHING
4. APRON (OPTIONAL)
5. END STOP
6. ROOF PURLIN
7. S-CLIP
8. **KAWA** R500 LOCKSEAM ROOF CONNECTOR
9. EAVE STOP (OPTIONAL)
10. RIDGE CAPPING



Roof Pitch

Owing to its unique deep corrugations, the **KAWA** R500 Lockseam profile can be installed on a roof pitch as low as 1°, making it virtually flat. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

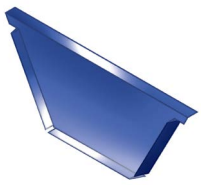
End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

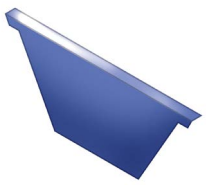
End Stops

The high ribs and trapezoidal shape of the **KAWA** R500 Lockseam profile require usage of end stops on the ridge side to prevent rainwater being driven into the building. The end stops are pre-lined with sealants before being fastened to the sheets by a snapping tool.

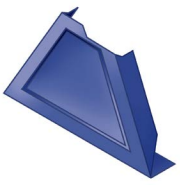
KAWA R500 Lockseam Accessories



END STOP



APRON



EAVE STOP

M8 BOLT & NUT

KAWA R500 ROOF CONNECTOR

S-CLIP

KAWA R650

Deep Corrugated Low Pitch Roof Profile

KAWA R650 Lockseam

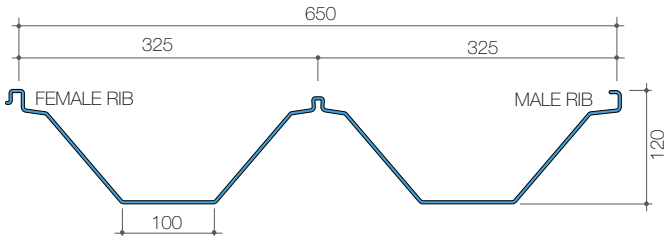
The **KAWA** R650 Lockseam signals a new era in conventional roof fixing technology. The constant fear of wind uplift and rainwater entering the side laps of roof sheets is now totally eliminated. With the **KAWA** R650 Lockseam, each side lap is locked and seamed by a revolutionary robotic seamer against high winds and rainstorms.

ADVANTAGES

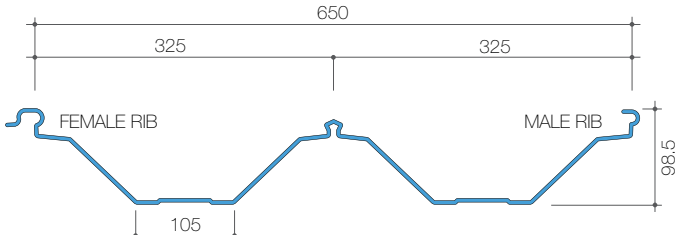
- A non-puncturing boltless roof, thus reducing potential leaks at fasteners.
- A concealed fixing system, resulting in a roof with clean lines uninterrupted by protruding screws or bolts and ensuring 100% watertightness.
- The unique lock and seam fastening process by a robotic seamer holds the roof sheets tightly against uplift or suction forces of strong winds.
- The profile's strikingly bold and deep corrugations make it an extremely structurally strong roof requiring fewer purlins, an almost flat roof pitch with a small fascia, all of which contribute to substantial savings in building costs.

SECTION VIEW

Lockseam Type I Profile

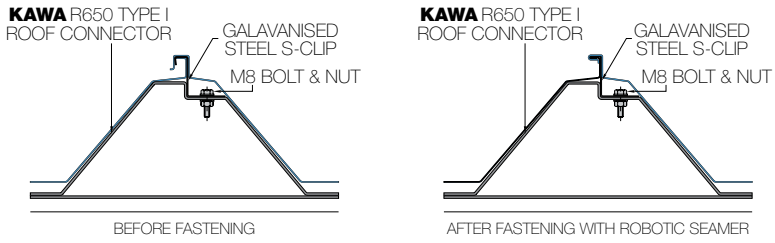


Lockseam Type II Profile

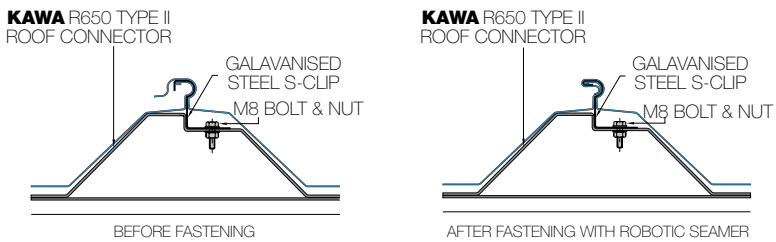


SIDE LAP

Lockseam Type I Profile



Lockseam Type II Profile



KAWA R650 Lockseam Specification

DIMENSIONS	
Overall Width (mm)	Nominal 670
Effective Cover Width (mm)	Nominal 650

MATERIAL	Steel					
Base Steel Thickness (BST), (mm)	0.48		0.60		*0.80	
	TYPE I	TYPE II	TYPE I	TYPE II	TYPE I	TYPE II
Rib Height (mm)	Nominal 120	Nominal 98.5	Nominal 120	Nominal 98.5	Nominal 120	Nominal 98.5

PROFILE WEIGHT			
Mass per Unit Area (kg/m²)	5.51	6.83	9.04
Mass per Unit Length (kg/m)	3.58	4.44	5.88
Area per Metric Tonne (m²/tonne)	181.51	146.33	110.60

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R650 LOCKSEAM

Span (m)							
1.2	Safe Load (kg/m²)	1492	913	1865	1141	2487	1521
	Deflection for Above Load (mm)	1	1	1	1	1	1
1.5	Safe Load (kg/m²)	955	584	1194	730	1592	974
	Deflection for Above Load (mm)	1	2	1	2	1	2
1.8	Safe Load (kg/m²)	663	406	829	507	1105	676
	Deflection for Above Load (mm)	2	2	2	2	2	2
2.1	Safe Load (kg/m²)	487	298	609	373	812	497
	Deflection for Above Load (mm)	3	3	3	3	3	3
2.4	Safe Load (kg/m²)	373	228	466	285	622	380
	Deflection for Above Load (mm)	4	4	4	4	4	4
2.7	Safe Load (kg/m²)	295	180	368	225	491	301
	Deflection for Above Load (mm)	5	5	5	5	5	5
3.0	Safe Load (kg/m²)	239	146	298	183	398	243
	Deflection for Above Load (mm)	6	6	6	6	6	6
3.5	Safe Load (kg/m²)	175	107	219	134	292	179
	Deflection for Above Load (mm)	8	9	8	9	8	9
4.0	Safe Load (kg/m²)	134	82	168	103	224	137
	Deflection for Above Load (mm)	10	12	10	12	10	12
4.5	Safe Load (kg/m²)	106	65	133	81	177	108
	Deflection for Above Load (mm)	13	15	13	15	13	15
5.0	Safe Load (kg/m²)	86	53	107	66	143	88
	Deflection for Above Load (mm)	16	18	16	18	16	18
5.5	Safe Load (kg/m²)	71	43	89	54	118	72
	Deflection for Above Load (mm)	19	22	19	22	19	22

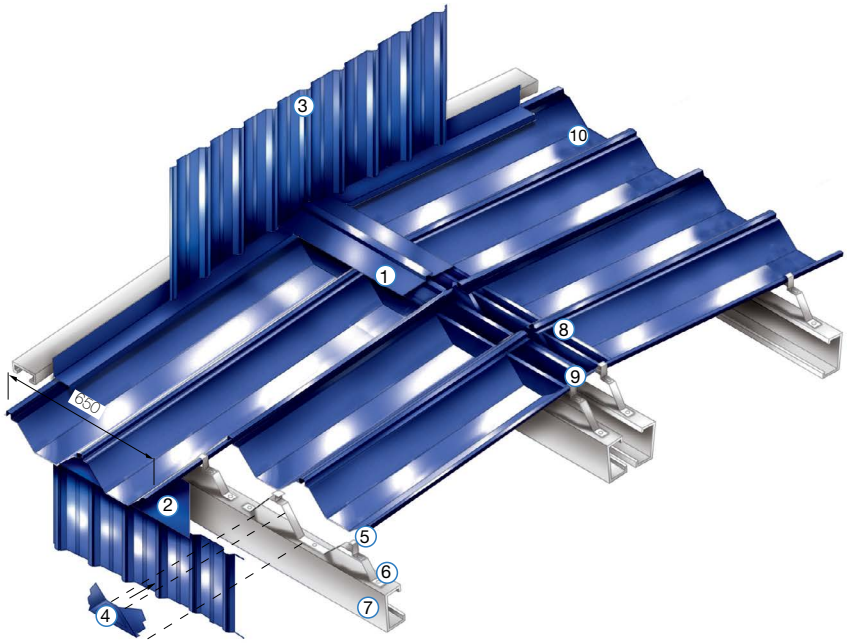
MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R650 LOCKSEAM

Roof Application						
Single Span (mm)	3000	2500	3400	2700	4000	3100
End Span (mm)	3250	2550	3700	2800	4200	3250
Internal Span (mm)	3600	3000	4000	3500	5000	4000
Free Cantilever (mm)	800	700	900	800	1100	900

* On Application only

KAWA R650 Lockseam For Roof & Wall Cladding

1. RIDGE CAPPING
2. FLASHING
3. **KAWA** R760 WALL CLADDING
4. EAVE STOP (OPTIONAL)
5. S-CLIP
6. **KAWA** R650 LOCKSEAM ROOF CONNECTOR
7. ROOF PURLIN
8. APRON (OPTIONAL)
9. END STOP
10. **KAWA** R650 LOCKSEAM ROOF SHEET



Roof Pitch

Owing to its unique deep corrugations, the **KAWA** R650 Lockseam profile can be installed on a roof pitch as low as 1°, making it virtually flat. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

End Laps

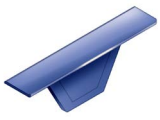
Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

End Stops

The high ribs and trapezoidal shape of the **KAWA** R650 Lockseam profile requires usage of end stops on the ridge side to prevent rainwater being driven into the building. The end stops are pre-lined with sealants before being fastened to the sheets by a snapping tool.

KAWA R650 Lockseam Accessories

Lockseam Type I Profile

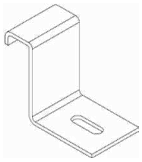

APRON


EAVE STOP

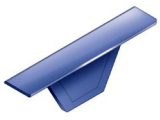

END STOP


M8 BOLT & NUT

KAWA R650 ROOF CONNECTOR


S-CLIP

Lockseam Type II Profile


APRON


EAVE STOP


END STOP


M8 BOLT & NUT

KAWA R650 ROOF CONNECTOR


S-CLIP

KAWA R600
High Rib Low Pitch Roof Profile

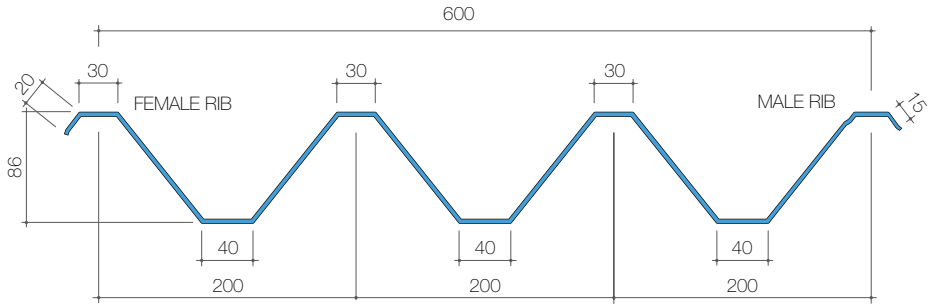
KAWA R600

The **KAWA** R600 is a high rib roof profile designed specifically for areas with heavy rainfall intensity. Its deep corrugations make it the ideal profile for tropical weather.

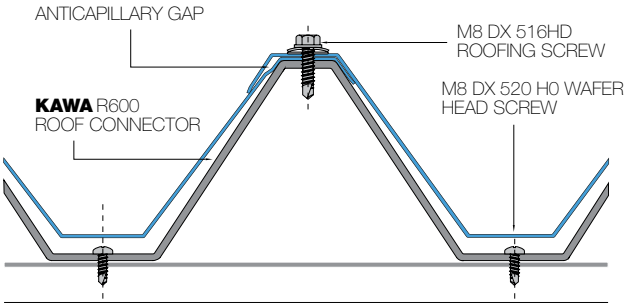
ADVANTAGES

- A stronger roof that contributes by reinforcing the entire steel structure.
- Less purlins used due to its high structural integrity, consequently lowering the total building cost.
- With its deep corrugations, only a low roof pitch is needed as the possibility of water overflowing into the side laps becomes non-existent.
- Fascia cost is drastically reduced since only a small fascia is required for a flatter roof.
- A profile bold in design, making it uniquely more expressive.

SECTION VIEW



SIDE LAP



KAWA R600
Specification

DIMENSIONS	
Overall Width (mm)	Nominal 660
Effective Cover Width (mm)	Nominal 600
Rib Height (mm)	Nominal 86
Crimp Depth (mm)	Nominal 6

MATERIAL	Steel			
Base Steel Thickness (BST), (mm)	0.42 'E'	0.48 'E'	0.60	*0.80
PROFILE WEIGHT				
Mass per Unit Area (kg/m²)	5.25	5.97	7.40	9.80
Mass per Unit Length (kg/m)	3.15	3.58	4.44	5.88
Area per Metric Tonne (m²/tonne)	190.44	167.55	135.07	102.09

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R600

Span (m)					
1.2	Safe Load (kg/m²)	2401	2744	1641	2187
	Deflection for Above Load (mm)	3.0	3.0	1.4	1.4
1.5	Safe Load (kg/m²)	1537	1756	1050	1400
	Deflection for Above Load (mm)	4.7	4.7	2.3	2.3
1.8	Safe Load (kg/m²)	1067	1220	729	972
	Deflection for Above Load (mm)	6.8	6.8	3.3	3.3
2.1	Safe Load (kg/m²)	784	896	536	714
	Deflection for Above Load (mm)	9.3	9.3	4.4	4.4
2.4	Safe Load (kg/m²)	600	686	410	547
	Deflection for Above Load (mm)	12.1	12.1	5.8	5.8
2.7	Safe Load (kg/m²)	474	542	324	432
	Deflection for Above Load (mm)	15.3	15.3	7.3	7.3
3.0	Safe Load (kg/m²)	384	439	262	350
	Deflection for Above Load (mm)	18.9	18.9	9.0	9.0
3.5	Safe Load (kg/m²)	282	323	193	257
	Deflection for Above Load (mm)	25.7	25.7	12.3	12.3
4.0	Safe Load (kg/m²)	216	247	148	197
	Deflection for Above Load (mm)	33.6	33.6	16.1	16.1
4.5	Safe Load (kg/m²)	171	195	117	156
	Deflection for Above Load (mm)	42.6	42.6	20.4	20.4
5.0	Safe Load (kg/m²)	158	158	94	126
	Deflection for Above Load (mm)	52.5	52.5	25.1	25.1
5.5	Safe Load (kg/m²)	114	131	78	104
	Deflection for Above Load (mm)	63.6	63.6	30.4	30.4

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R600

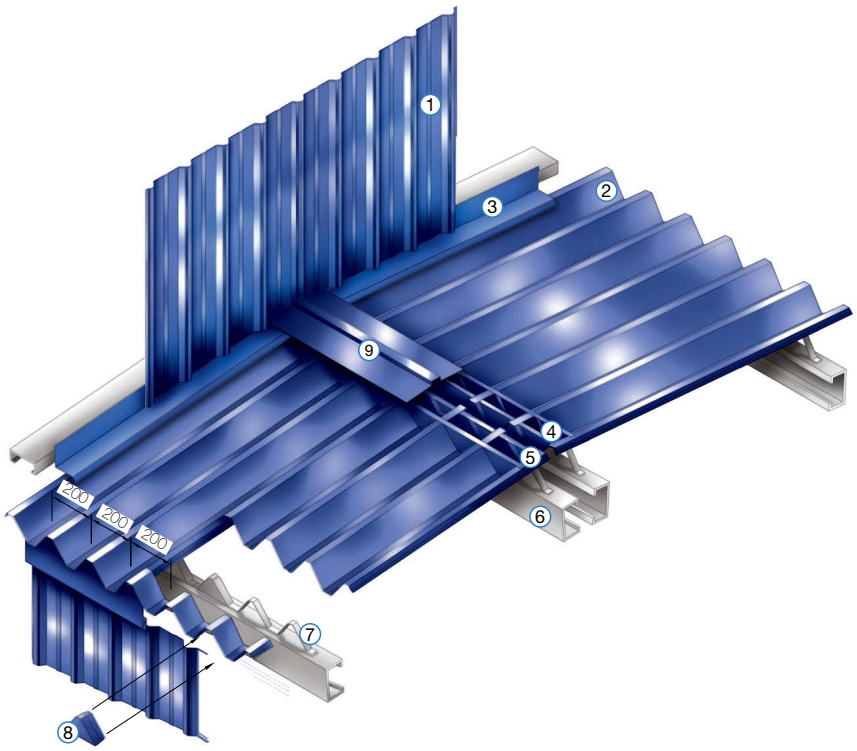
Roof Application				
Single Span (mm)	3000	3200	3300	3900
End Span (mm)	3200	3400	3500	4000
Internal Span (mm)	3600	3800	3900	4800
Free Cantilever (mm)	800	800	900	1100

Wall Application				
Single Span (mm)	3400	3600	3700	4200
End Span (mm)	3700	3900	4000	4400
Internal Span (mm)	4100	4400	4500	5200
Free Cantilever (mm)	800	800	900	1100

* On Application only
'E' = High Tensile Steel (550 MPa)

KAWA R600
For Roof & Wall Cladding

1. **KAWA** R760 WALL CLADDING
2. **KAWA** R600 ROOF SHEET
3. FLASHING
4. APRON (OPTIONAL)
5. END STOP
6. ROOF PURLIN
7. **KAWA** R600 ROOF CONNECTOR
8. EAVE STOP (OPTIONAL)
9. RIDGE CAPPING



Roof Pitch

The **KAWA** R600 profile can be installed on a roof pitch as low as 1°, making it virtually flat. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

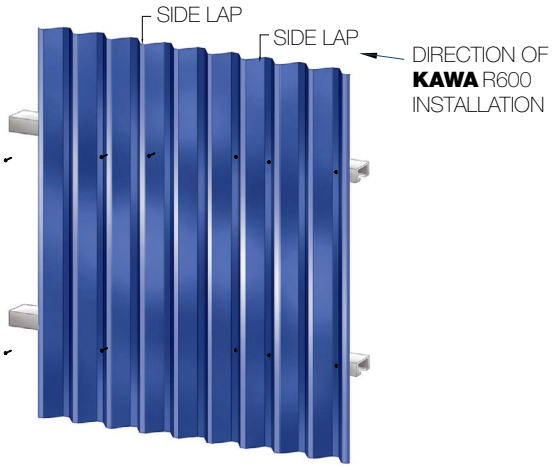
End Laps

Where end laps are inevitable, have a minumum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

End Stops

The high ribs and trapezoidal shape of the **KAWA** R600 profile requires usage of end stops on the ridge side to prevent rainwater being driven into the building. The end stops are pre-lined with sealants before being fastened to the sheets by a snapping tool.

Valley Fastening of KAWA R600 as a Wall Cladding



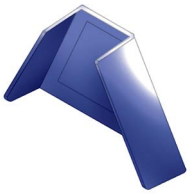
KAWA R600 Accessories

M5 DX 520 HO
FOR ROOF CONNECTOR

M5 DX 516 HM
FOR ROOFING

APRON

KAWA R600
ROOF CONNECTOR

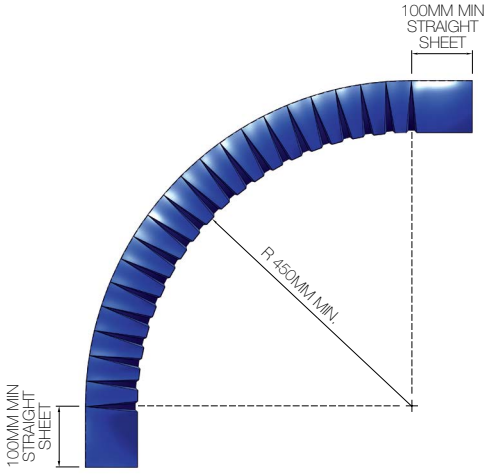


EAVE STOP

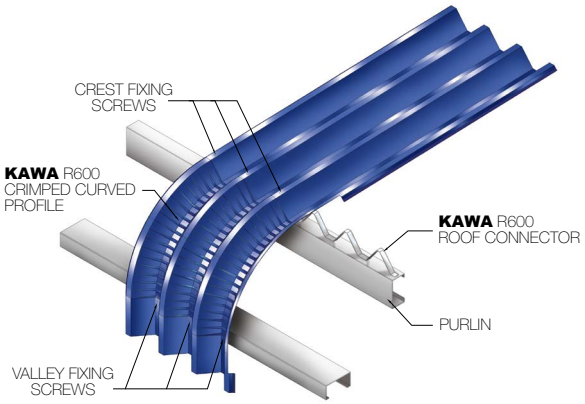
END STOP

Crimped Curved Roof

DIAGRAM SHOWING THE RADIUS OF CURVATURE OF THE **KAWA** R600 CRIMPED CURVED PROFILE



TYPICAL ASSEMBLY DRAWING OF THE **KAWA** R600 CRIMPED CURVED PROFILE



The KAWA R600 Crimped Curved profile adds beauty and functionality to the building envelope with advantages as follows:-

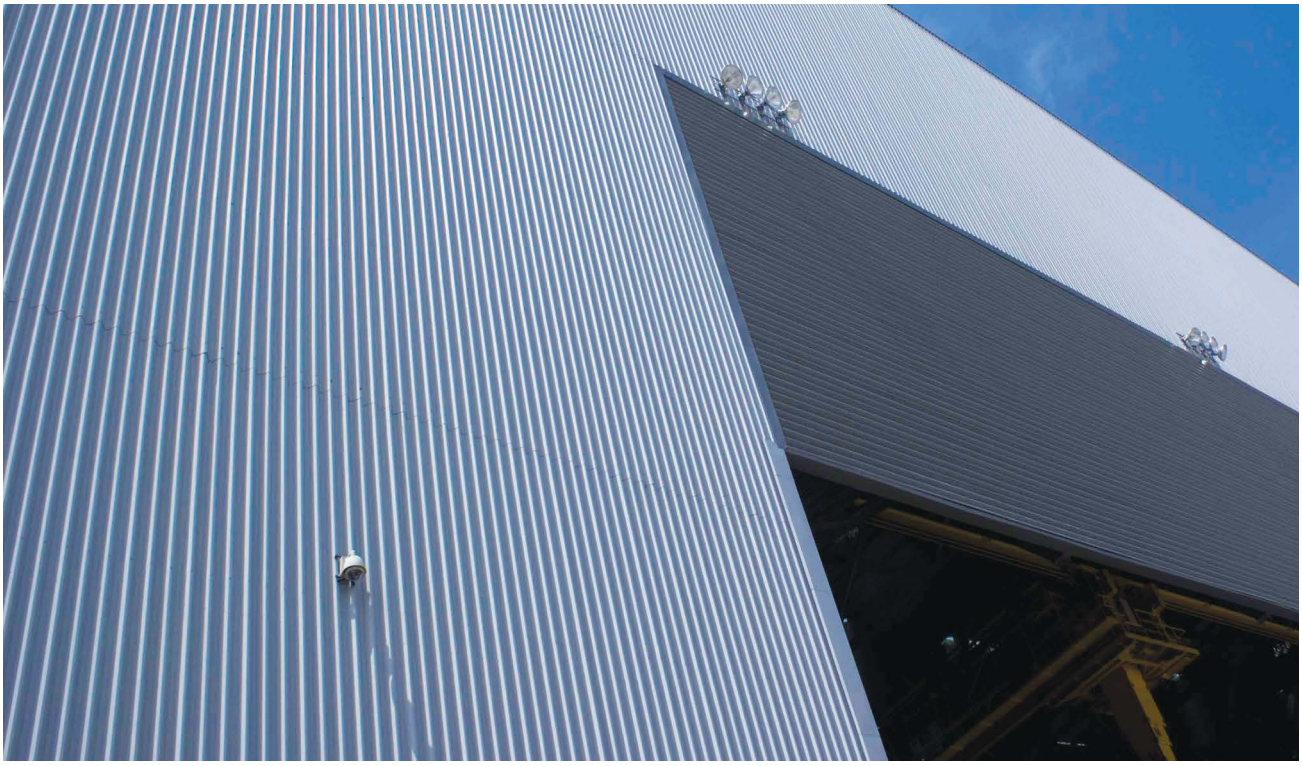
- Fewer structural supports required for fascias and roofs.
- Aesthetically attractive exterior finish with simple installation.
- Reduced number of flashings and cappings.

Ensure that the sheets are lifted onto the roof the right way up with the male and female ribs in the desired direction, otherwise sheets will have to be orientated during installation.

Where a few sheets are required to cover the whole length of the roof due to handling or transport considerations, installation shall start from the bottom to the top before moving on to the next run of roof. At the end laps, a minimum of 250 mm end lap is required for a 5˚ roof pitch and below, and a minimum of 200 mm end lap is required for a roof pitch exceeding 5˚. To ensure watertightness, apply a good sealant to the end lap.

For the **KAWA** R600 Crimped Curved profile, valley fixing of the sheet is recommended only on the fascia purlin. For the rest of the purlins, screws should be fixed on the crests of the ribs which are supported by roof connectors.

KAWA R600
Projects Reference



KAWA R670
Clip

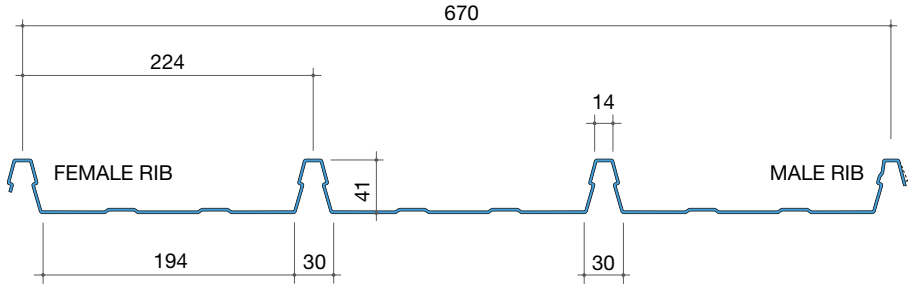
KAWA R670

The **KAWA** R670 is a high rib roof profile especially ideal for heavy rainfall intensity areas. With its wide tray configurations, water is safely dispersed of from the roof surface area even at a minimum roof pitch of 1˚.

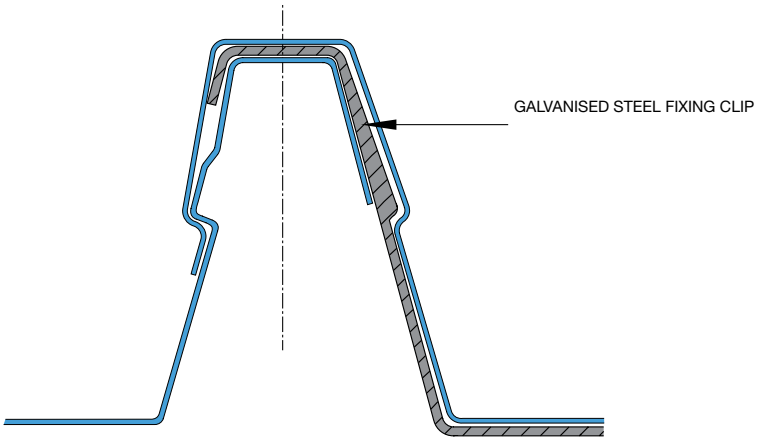
ADVANTAGES

- It is a non-puncturing boltless roof. This unique fastening system greatly reduces the risk of leakage at fasteners of conventional systems.
- High ribbed profile resulting in a stronger roof spanning wider purlin centres.
- A lower pitched roof, effectively reducing fascia usage.
- Wider profile, therefore increasing installation speed.

SECTION VIEW



SIDE LAP



KAWA R670
Specification

DIMENSIONS	
Overall Width (mm)	Nominal 700
Effective Cover Width (mm)	Nominal 670
Rib Height (mm)	Nominal 41
Crimp Depth (mm) for Curvature	Nominal 3.5

MATERIAL	Steel		
Base Steel Thickness (BST), (mm)	0.42'E'	0.48'E'	*0.60'E'

PROFILE WEIGHT			
Mass per Unit Area (kg/m^2)	4.70	5.34	6.63
Mass per Unit Length (kg/m)	3.15	3.58	4.44
Area per Metric Tonne (m^2/tonne)	212.66	187.10	150.83

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R670				
Span (m)				
1.2	Safe Load (kg/m^2)	580	662	828
	Deflection for Above Load (mm)	4	4	4
1.5	Safe Load (kg/m^2)	371	424	530
	Deflection for Above Load (mm)	6	6	6
1.8	Safe Load (kg/m^2)	258	294	368
	Deflection for Above Load (mm)	9	9	9
2.1	Safe Load (kg/m^2)	189	216	270
	Deflection for Above Load (mm)	12	12	12
2.4	Safe Load (kg/m^2)	145	166	207
	Deflection for Above Load (mm)	16	16	16
2.7	Safe Load (kg/m^2)	114	131	164
	Deflection for Above Load (mm)	20	20	20
3.0	Safe Load (kg/m^2)	93	106	132
	Deflection for Above Load (mm)	25	25	25
3.5	Safe Load (kg/m^2)	68	78	97
	Deflection for Above Load (mm)	34	34	34

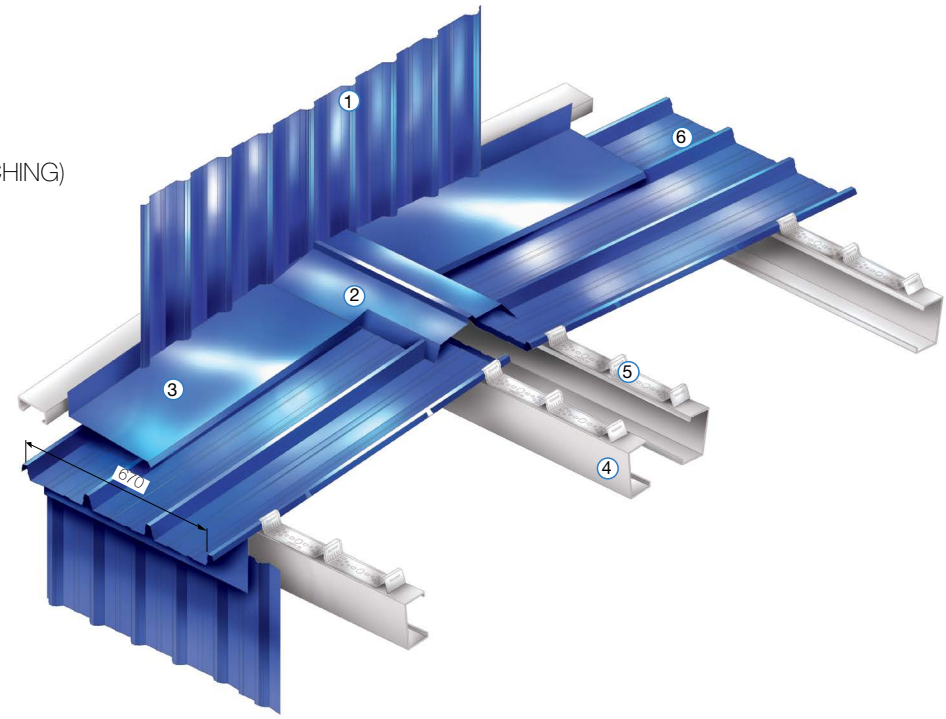
MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R670			
Roof Application			
Single Span (mm)	1500	1600	2000
End Span (mm)	1650	1800	2300
Internal Span (mm)	2000	2200	2700
Free Cantilever (mm)	300	400	400

Wall Application			
Single Span (mm)	1900	2200	2300
End Span (mm)	2200	2400	2600
Internal Span (mm)	2400	2900	3000
Free Cantilever (mm)	300	400	400

* On Application only
'E' = High Tensile Steel (550 MPa)

KAWA R670
For Roof & Wall Cladding

1. **KAWA** R670 WALL CLADDING
2. RIDGE CAPPING (OPTIONAL NOTCHING)
3. FLASHING
4. ROOF PURLIN
5. **KAWA** R670 FIXING CLIP
6. **KAWA** R670 ROOF SHEET



Roof Pitch

Owing to its unique high rib design, the **KAWA** R670 profile can be installed on a roof pitch as low as 1°. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done using a turn-up tool, turning up the tray between crests at the ridge end of the sheet (Fig.1). Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the eave end of the sheet (Fig.2). Both these operations can be carried out before or after installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5°.

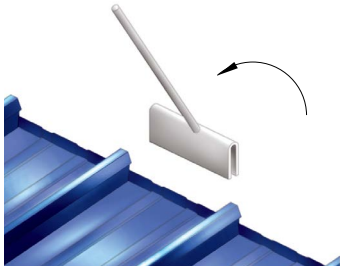


Fig.1: Stop ending of **KAWA** R670

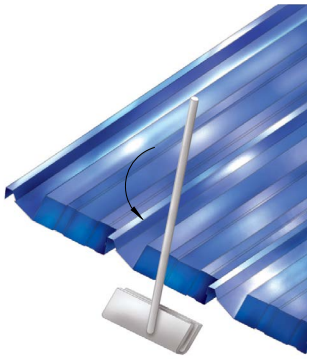
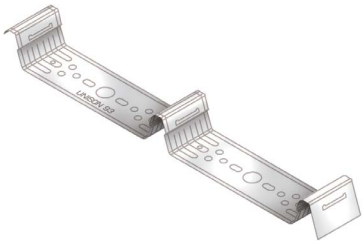


Fig.2: Lipping of **KAWA** R670

KAWA R670 Accessories

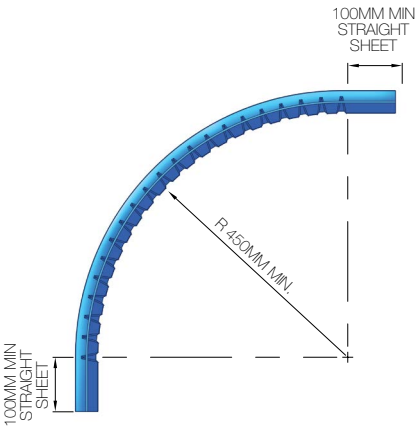


KAWA R670 FIXING CLIP

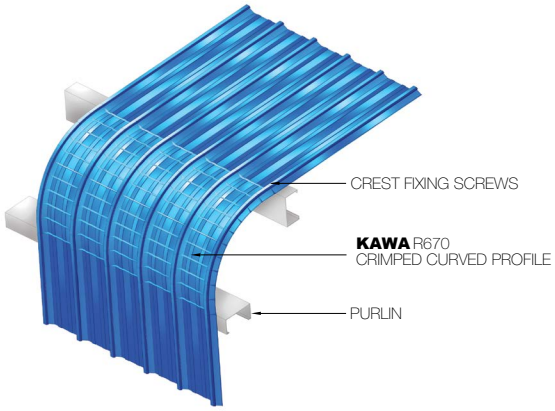
WAFER HEAD DX 522 WO
FOR FIXING CLIP

Crimped Curved Roof

DIAGRAM SHOWING THE RADIUS OF CURVATURE OF THE **KAWA** R670 CRIMPED CURVED PROFILE



TYPICAL ASSEMBLY DRAWING OF THE **KAWA** R670 CRIMPED CURVED PROFILE



The KAWA R670 Crimped Curved profile adds beauty and functionality to the building envelope with advantages as follows:-

- Fewer structural supports required for fascias and roofs.
- Aesthetically attractive exterior finish with simple installation.
- Reduced number of flashings and cappings.

Ensure that the sheets are lifted onto the roof the right way up with the male and female ribs in the desired direction, otherwise sheets will have to be orientated during installation.

Where a few sheets are required to cover the whole length of the roof due to handling or transport considerations, installation shall start from the bottom to the top before moving on to the next run of roof. At the end laps, a minimum of 250 mm end lap is required for a 5° roof pitch and below, and a minimum of 200 mm end lap is required for a roof pitch exceeding 5°. To ensure watertightness, apply a good sealant to the end lap.

For the **KAWA** R670 Crimped Curved profile, valley fixing of the sheet is recommended only on the fascia purlin. For the rest of the purlins, screws should be fixed on the crests of the ribs which are supported by fixing clips.

KAWA R670
Projects Reference

KAWA R700
Clip

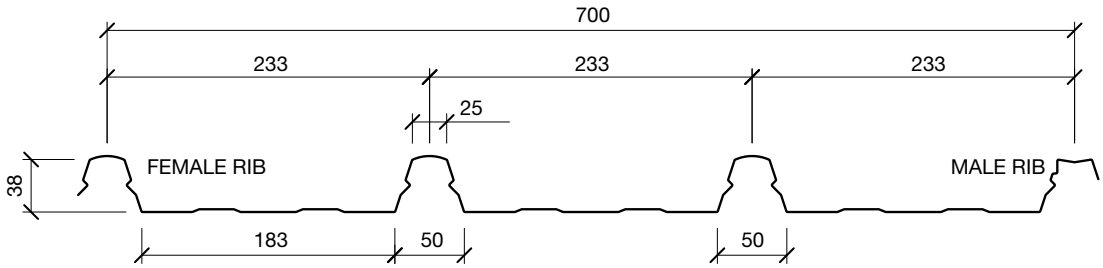
KAWA R700

A new concealed Clip Fixing Roof Profile with improved fastening.

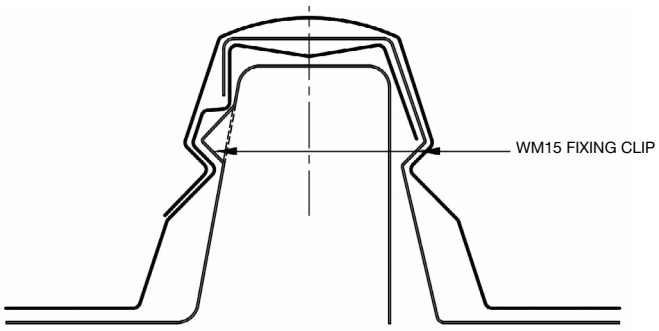
ADVANTAGES

- All four ribs of the roof sheet are fully anchored by the design registered WM15 clips for a much improved and secured fastening.
- Less appearance of unevenness when installed with insulation wool.
- Economical, quick and easy to install.
- Capable of being used as a roof panel on a 1° roof slope.
- Available in convex crimped curved designs.

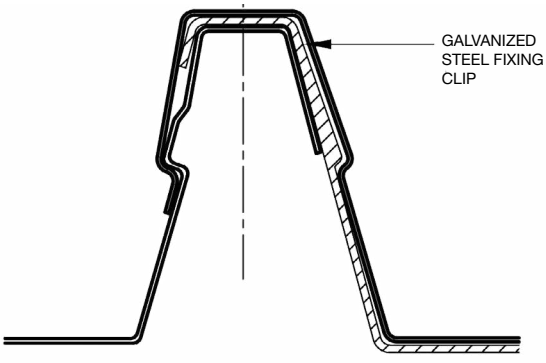
SECTION VIEW



SIDE LAP



WM15



UNISON 16

KAWA R700
Specification

DIMENSIONS	
Overall Width (mm)	Nominal 730
Effective Cover Width (mm)	Nominal 700
Rib Height (mm)	Nominal 38
Crimp Depth (mm) for Curvature	Nominal 3.3

MATERIAL	Steel		
Base Steel Thickness (BST), (mm)	0.42'E'	0.48'E'	*0.60'E'
PROFILE WEIGHT			
Mass per Unit Area (kg/m^2)	4.50	5.13	6.37
Mass per Unit Length (kg/m)	3.15	3.58	4.44
Area per Metric Tonne (m^2/tonne)	222	195	157

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R700

Span (m)				
1.2	Safe Load (kg/m^2)	695	795	993
	Deflection for Above Load (mm)	5	5	5
1.5	Safe Load (kg/m^2)	445	509	636
	Deflection for Above Load (mm)	7	7	7
1.8	Safe Load (kg/m^2)	309	353	441
	Deflection for Above Load (mm)	10	10	10
2.1	Safe Load (kg/m^2)	227	259	324
	Deflection for Above Load (mm)	14	14	14
2.4	Safe Load (kg/m^2)	174	199	248
	Deflection for Above Load (mm)	19	19	19
2.7	Safe Load (kg/m^2)	137	157	196
	Deflection for Above Load (mm)	24	24	24
3.0	Safe Load (kg/m^2)	111	127	159
	Deflection for Above Load (mm)	29	29	29
3.3	Safe Load (kg/m^2)	92	105	131
	Deflection for Above Load (mm)	35	35	35
3.6	Safe Load (kg/m^2)	77	88	101
	Deflection for Above Load (mm)	42	42	42

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R700

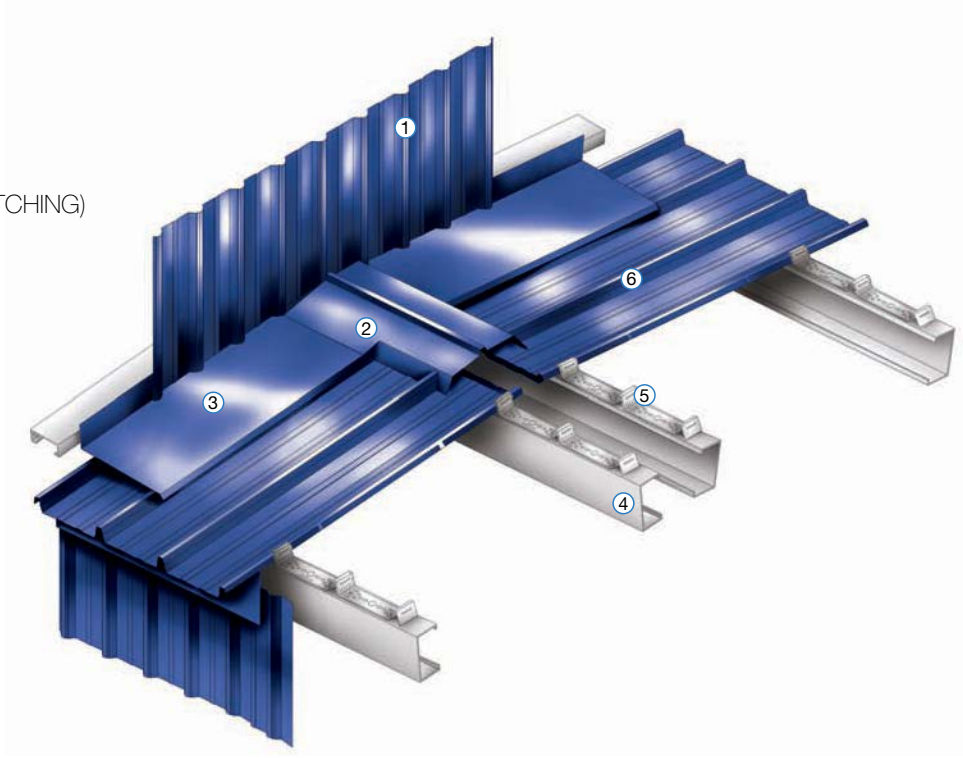
Roof Application			
Single Span (mm)	1800	1875	2050
End Span (mm)	1950	2025	2200
Internal Span (mm)	2400	2525	2800
Free Cantilever (mm)	300	300	400

Wall Application			
Single Span (mm)	2000	2050	2200
End Span (mm)	2250	2325	2500
Internal Span (mm)	2600	2750	3000
Free Cantilever (mm)	300	300	400

* On Application only
'E' = High Tensile Sheet (550 MPa)

KAWA R700
For Roof & Wall Cladding

1. **KAWA** R700 WALL CLADDING
2. RIDGE CAPPING (OPTIONAL NOTCHING)
3. FLASHING
4. ROOF PURLIN
5. WM15 FIXING CLIP
6. **KAWA** R700 ROOF SHEET



scan for installation procedure

Roof Pitch

Owing to its unique high rib design, the **KAWA** R700 can be installed on a roof pitch as low as 1°. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven purlins.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant.

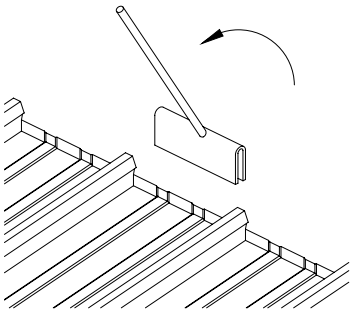


Fig.1: Stop ending of **KAWA** R700

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done using a turn-up tool, turning up the tray between crests at the end of the sheet. Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the end of the sheet. Both these operations can be carried out before or after installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5°.

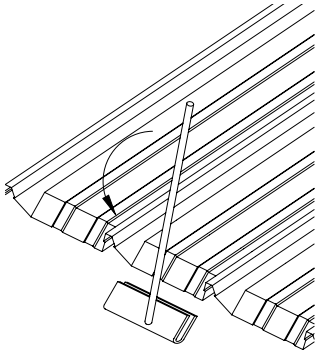
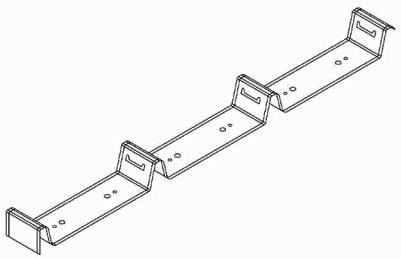
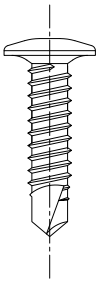


Fig.2: Lipping of **KAWA** R700

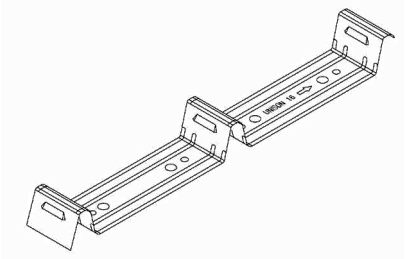
KAWA R700 Accessories



WM15 FIXING CLIP



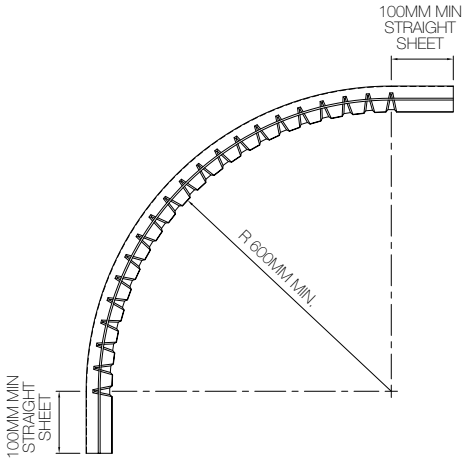
WAFER HEAD DX 522 WO FOR FIXING CLIP



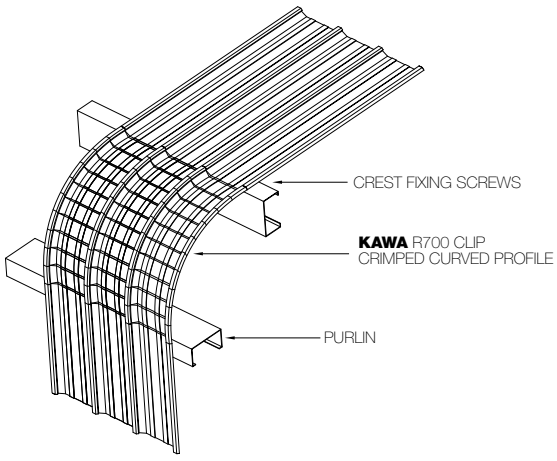
UNISON 16

Crimped Curved Roof

DIAGRAM SHOWING THE RADIUS OF CURVATURE OF THE **KAWA** R700 CRIMPED CURVED PROFILE



TYPICAL ASSEMBLY DRAWING OF THE **KAWA** R700 CRIMPED CURVED PROFILE



The KAWA R700 Crimped Curved profile adds beauty and functionality to the building envelope with advantages as follows:-

- Fewer structural supports required for fascias and roofs.
- Aesthetically attractive exterior finish with simple installation.
- Reduced number of flashings and cappings.

Ensure that the sheets are lifted onto the roof the right way up with the male and female ribs in the desired direction, otherwise sheets will have to be orientated during installation.

Where a few sheets are required to cover the whole length of the roof due to handling or transport considerations, installation shall start from the bottom to the top before moving on to the next run of roof. At the end laps, a minimum of 250 mm end lap is required for a 5˚ roof pitch and below, and a minimum of 200 mm end lap is required for a roof pitch exceeding 5˚. To ensure watertightness, apply a good sealant to the end lap.

For the **KAWA** R700 Crimped Curved profile, valley fixing of the sheet is recommended only on the fascia purlin. For the rest of the purlins, screws should be fixed on the crests of the ribs which are supported by fixing clips.

KAWA R700
Projects Reference

KAWA R715
Bold & Deep Corrugation

FM APPROVED

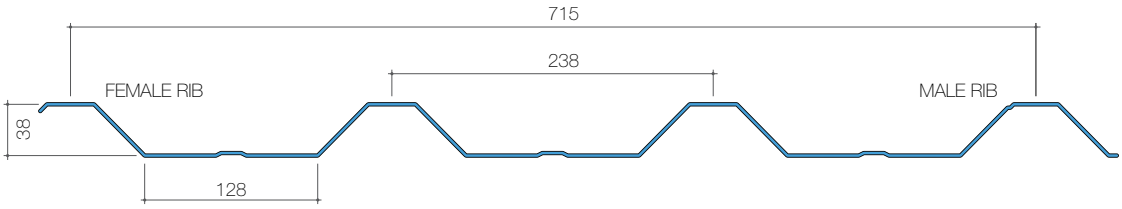
KAWA R715

An economical 1° roof with bold and deep corrugations for aesthetics, strength and heavy rains. Ideally suited for use at power stations or alternatively as internal roof decking for some double skin roof systems.

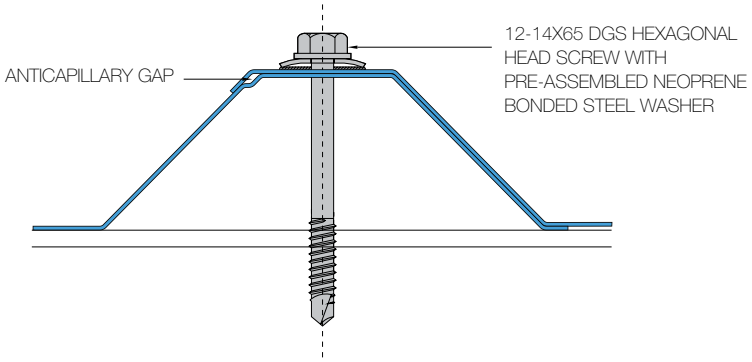
ADVANTAGES

- Factory mutual (FM) approved.
- Capable of being used as a roof panel on a 1° roof slope.
- Quick and easy to install.
- Available in convex and concave crimped curved designs.
- Bold and deep corrugations contemporary roof and wall cladding design.

SECTION VIEW



SIDE LAP



KAWA R715
Specification

DIMENSIONS									
Overall Width (mm)	Nominal 802								
Effective Cover Width (mm)	Nominal 715								
Rib Height (mm)	Nominal 38								

MATERIAL	Steel								
Grade of Steel	G550					G300			
Base Steel Thickness (BST), (mm)	0.35 'E'	0.42 'E'	0.48 'E'	0.55 'E'	0.60 'E'	0.70	0.75	0.80	0.90

PROFILE WEIGHT									
Mass per Unit Area (kg/m²)	3.64	4.41	5.01	5.71	6.21	7.22	7.72	8.22	9.22
Mass per Unit Length (kg/m)	2.60	3.15	3.58	4.08	4.44	5.16	5.52	5.88	6.59
Area per Metric Tonne (m²/tonne)	274.72	226.94	199.66	175.10	160.96	138.58	129.57	121.66	108.42

DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R715

Span (m)										
0.9	Safe Load (kg/m²)	1237	1484	1696	1944	2120	-	-	-	-
	Deflection for Above Load (mm)	3	3	3	3	3	-	-	-	-
1.2	Safe Load (kg/m²)	696	835	954	1093	1193	670	718	766	862
	Deflection for Above Load (mm)	5	5	5	5	5	3	3	3	3
1.5	Safe Load (kg/m²)	445	534	611	700	763	429	460	490	552
	Deflection for Above Load (mm)	8	8	8	8	8	4	4	4	4
1.8	Safe Load (kg/m²)	309	371	424	486	530	298	319	341	383
	Deflection for Above Load (mm)	12	12	12	12	12	6	6	6	6
2.1	Safe Load (kg/m²)	227	273	312	357	389	219	235	250	281
	Deflection for Above Load (mm)	16	16	16	16	16	8	8	8	8
2.4	Safe Load (kg/m²)	174	209	239	273	298	168	180	192	215
	Deflection for Above Load (mm)	21	21	21	21	21	10	10	10	10
2.7	Safe Load (kg/m²)	137	165	188	216	236	132	142	151	170
	Deflection for Above Load (mm)	27	27	27	27	27	13	13	13	13
3.0	Safe Load (kg/m²)	111	134	153	175	191	107	115	123	138
	Deflection for Above Load (mm)	33	33	33	33	33	16	16	16	16
3.3	Safe Load (kg/m²)	92	110	126	145	158	89	95	101	114
	Deflection for Above Load (mm)	40	40	40	40	40	19	19	19	19
3.6	Safe Load (kg/m²)	77	93	106	121	133	74	80	85	96
	Deflection for Above Load (mm)	48	48	48	48	48	23	23	23	23
3.9	Safe Load (kg/m²)	-	-	-	-	-	63	68	73	82
	Deflection for Above Load (mm)	-	-	-	-	-	27	27	27	27
4.2	Safe Load (kg/m²)	-	-	-	-	-	55	59	63	70
	Deflection for Above Load (mm)	-	-	-	-	-	31	31	31	31

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R715

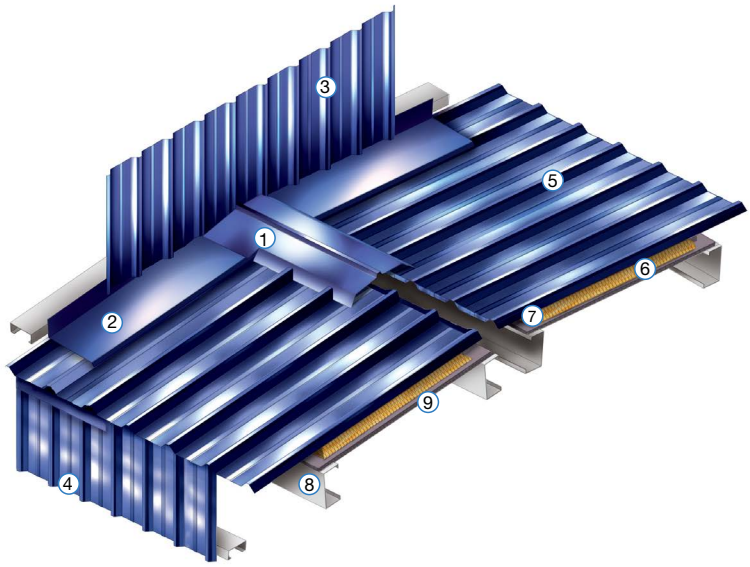
Roof Application									
Single Span (mm)	1700	1800	1900	2000	2100	2000	2100	2200	2300
End Span (mm)	1800	1900	2000	2100	2200	2100	2200	2300	2400
Internal Span (mm)	2150	2300	2450	2600	2750	2500	2700	2800	2900
Free Cantilever (mm)	300	350	400	450	500	300	350	450	500

Wall Application									
Single Span (mm)	1900	2050	2200	2350	2500	2400	2500	2600	2700
End Span (mm)	1900	2050	2200	2350	2500	2400	2500	2600	2700
Internal Span (mm)	2400	2550	2700	2800	2900	3100	3200	3300	3400
Free Cantilever (mm)	300	350	400	450	500	300	350	450	500

'E' = High Tensile Steel (550 MPa)

KAWA R715
For Roof & Wall Cladding

1. RIDGE CAPPING (OPTIONAL NOTCHING)
2. FLASHING
3. **KAWA** R715 WALL CLADDING
4. SCREWS
5. **KAWA** R715 ROOF SHEET
6. INSULATION WOOL
7. ALUMINIUM FOIL
8. ROOF PURLIN
9. HEXAGONAL GALVANISED CHICKEN WIRE MESH



Roof Pitch

The minimum recommended roof pitch for the **KAWA** R715 profile is 1°. However, it is recommended that a roof pitch of 2° be considered during designing to avoid silt accumulation due to reduced water velocity and possible ponding as a result of uneven Purlins.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

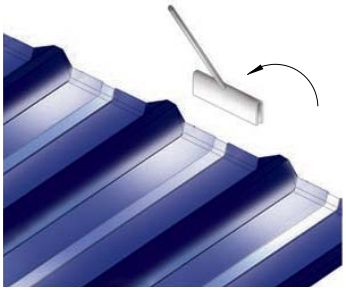


Fig.1: Stop ending of **KAWA** R715

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done by a turn-up tool, turning up the tray between crests at the ridge end of the sheet (Fig.1). Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the eave end of the sheet (Fig.2). Lipping prevents water from being driven into the building by wind or capillary action. Both of these operations can be carried out before or after the installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5°.

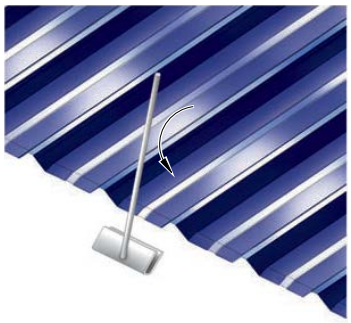
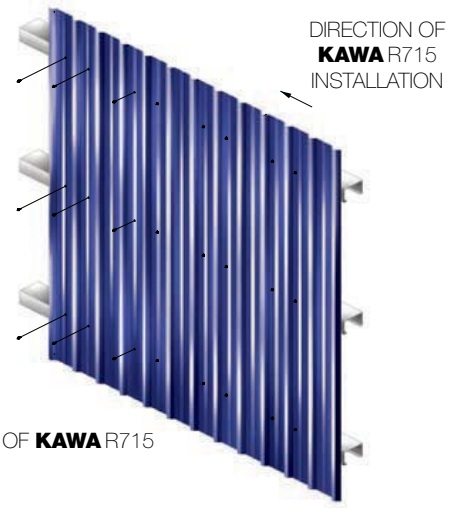


Fig.2: Lipping of **KAWA** R715

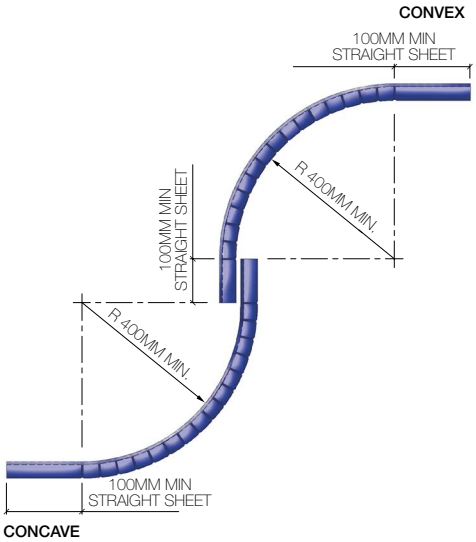
KAWA R715
Valley Fastening as a Wall Cladding



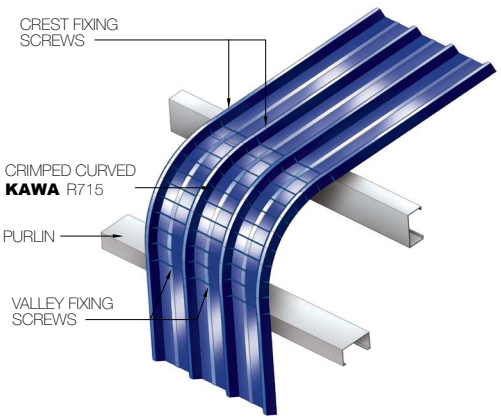
VALLEY FASTENING OF **KAWA** R715

Convex and Concave Roof

DIAGRAM SHOWING THE RADIUS OF CURVATURE OF THE **KAWA** R715 CRIMPED CURVED PROFILE



TYPICAL ASSEMBLY DRAWING OF THE **KAWA** R715 CRIMPED CURVED PROFILE



The KAWA R715 Crimped Curved Convex and Concave profile adds beauty and functionality to the building envelope with advantages as follows:-

- Fewer structural supports required for fascias and roofs.
- Aesthetically attractive exterior finish with simple installation.
- Reduced number of flashings and cappings.

Ensure that the sheets are lifted onto the roof the right way up with the male and female ribs in the desired direction, otherwise sheets will have to be orientated during installation.

Where a few sheets are required to cover the whole length of the roof due to handling or transport considerations, installation shall start from the bottom to the top before moving on to the next run of roof. At the end laps, a minimum of 250 mm end lap is required for a 5° roof pitch and below, and a minimum of 200 mm end lap is required for a roof pitch exceeding 5°. To ensure watertightness, apply a good sealant to the end lap.

For the **KAWA** R715 Crimped Curved profile, valley fixing of the sheet is recommended only on the fascia purlin. For the rest of the purlins, screws should be fixed on the crests of the ribs into the purlins below.

KAWA R715
Projects Reference

KAWA R760

Unique Web for Extra Strength

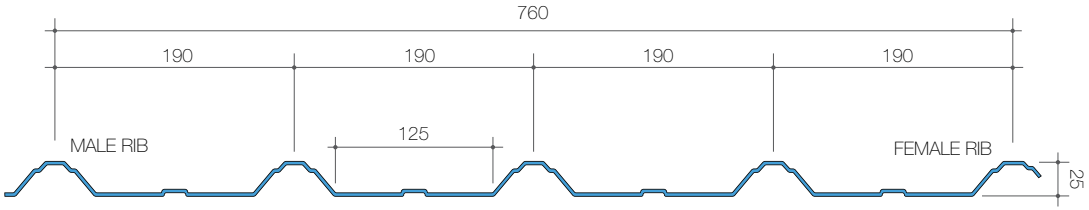
KAWA R760

The **KAWA** R760 is a 5-corrugation profile suitable for roof and wall cladding. Each corrugation incorporates a reinforcing web to give the profile extra strength. The custom cut sheet can be applied to industrial, commercial and even residential buildings.

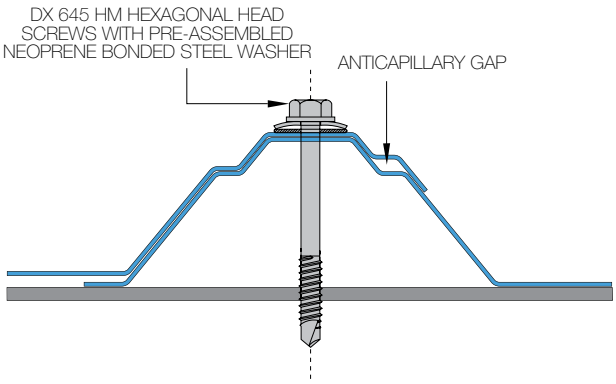
ADVANTAGES

- Aesthetically attractive profile with reinforcing web on the corrugations spaced by wide pans, makes it uniquely distinct from other roofing.
- Steel sheets are strengthened because of corrugations. With the additional reinforcing web, the strength of the **KAWA** R760 profile is further enhanced.

SECTION VIEW



SIDE LAP



KAWA R760
Specification

DIMENSIONS				
Overall Width (mm)	Nominal 820			
Effective Cover Width (mm)	Nominal 760			
Rib Height (mm)	Nominal 25			
Crimp Depth (mm)	Nominal 3			

MATERIAL	Steel			
Base Steel Thickness (BST), (mm)	0.35 'E'	0.42 'E'	0.48 'E'	*0.60 'E'

PROFILE WEIGHT				
Mass per Unit Area (kg/m²)	3.42	4.15	4.71	5.84
Mass per Unit Length (kg/m)	2.60	3.15	3.58	4.44
Area per Metric Tonne (m²/tonne)	292.01	241.23	212.23	171.09

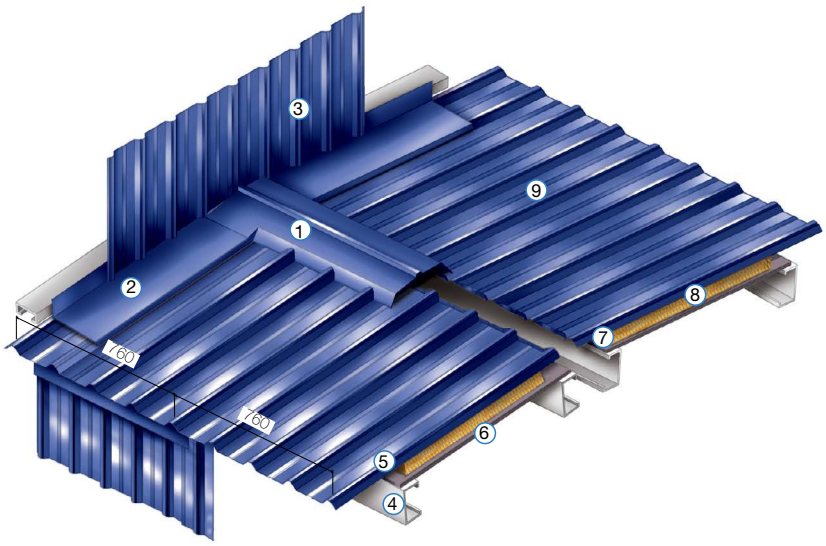
DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R760					
Span (m)					
0.9	Safe Load (kg/m²)	568	682	779	974
	Deflection for Above Load (mm)	4	4	4	4
1.2	Safe Load (kg/m²)	320	383	438	548
	Deflection for Above Load (mm)	7	7	7	7
1.5	Safe Load (kg/m²)	204	245	280	351
	Deflection for Above Load (mm)	11	11	11	11
1.8	Safe Load (kg/m²)	142	170	195	243
	Deflection for Above Load (mm)	16	16	16	16
2.1	Safe Load (kg/m²)	104	125	143	179
	Deflection for Above Load (mm)	22	22	22	22
2.4	Safe Load (kg/m²)	80	96	110	137
	Deflection for Above Load (mm)	28	28	28	28

MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R760				
Roof Application				
Single Span (mm)	1050	1200	1350	1450
End Span (mm)	1250	1350	1500	1700
Internal Span (mm)	1500	1700	1850	2000
Free Cantilever (mm)	125	150	150	200
Wall Application				
Single Span (mm)	1400	1600	1650	1850
End Span (mm)	1350	1700	1800	1950
Internal Span (mm)	1900	2050	2200	2300
Free Cantilever (mm)	125	150	150	200

* On Application only
'E' = High Tensile Steel (550 MPa)

KAWA R760
For Roof & Wall Cladding

1. RIDGE CAPPING (OPTIONAL NOTCHING)
2. FLASHING
3. **KAWA** R760 WALL CLADDING
4. ROOF PURLIN
5. SCREWS
6. HEXAGONAL GALVANISED CHICKEN WIRE MESH
7. ALUMINIUM FOIL
8. INSULATION
9. **KAWA** R760 ROOF SHEET



Roof Pitch

The minimum recommended roof pitch for the **KAWA** R760 profile is 3°. For sheet lengths greater than 31 metres, the pitch should be increased by 1° for every 5 metres of additional length.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5° roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5°. Ensure watertightness by applying a good sealant to the end lap.

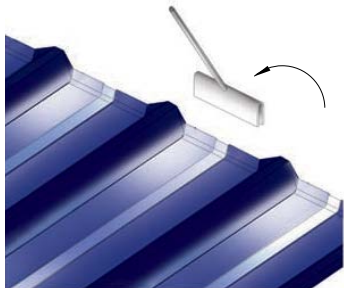


Fig.1: Stop ending of **KAWA** R760

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done by a turn-up tool, turning up the tray between crests at the ridge end of the sheet (Fig.1). Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the eave end of the sheet (Fig.2). Lipping prevents water from being driven into the building by wind or capillary action. Both of these operations can be carried out before or after the installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5°.

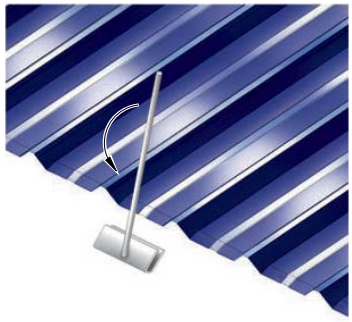
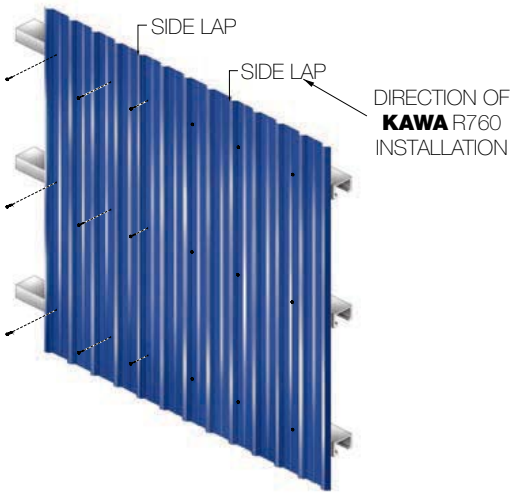


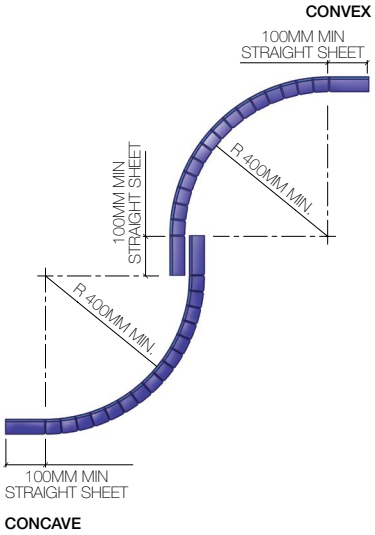
Fig.2: Lipping of **KAWA** R760

KAWA R760 Accessories

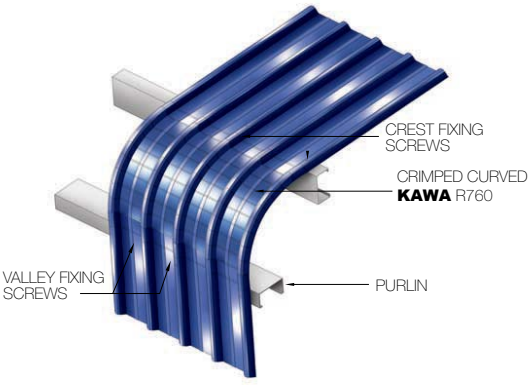


Convex and Concave Roof

DIAGRAM SHOWING THE RADIUS OF CURVATURE OF THE **KAWA** R760 CRIMPED CURVED PROFILE



TYPICAL ASSEMBLY DRAWING OF THE **KAWA** R760 CRIMPED CURVED PROFILE



The KAWA R760 Crimped Curved Convex and Concave profile adds beauty and functionality to the building envelope with advantages as follows:-

- Fewer structural supports required for fascias and roofs.
- Aesthetically attractive exterior finish with simple installation.
- Reduced number of flashings and cappings.

Ensure that the sheets are lifted onto the roof the right way up with the male and female ribs in the desired direction, otherwise sheets will have to be orientated during installation.

Where a few sheets are required to cover the whole length of the roof due to handling or transport considerations, installation shall start from the bottom to the top before moving on to the next run of roof. At the end laps, a minimum of 250 mm end lap is required for a 5° roof pitch and below, and a minimum of 200 mm end lap is required for a roof pitch exceeding 5°. To ensure watertightness, apply a good sealant to the end lap.

For the **KAWA** R760 Crimped Curved profile, valley fixing of the sheet is recommended only on the fascia purlin. For the rest of the purlins, screws should be fixed on the crests of the ribs.

KAWA R760
Projects Reference

KAWA HOMAGE
Long Length Stepped Roof

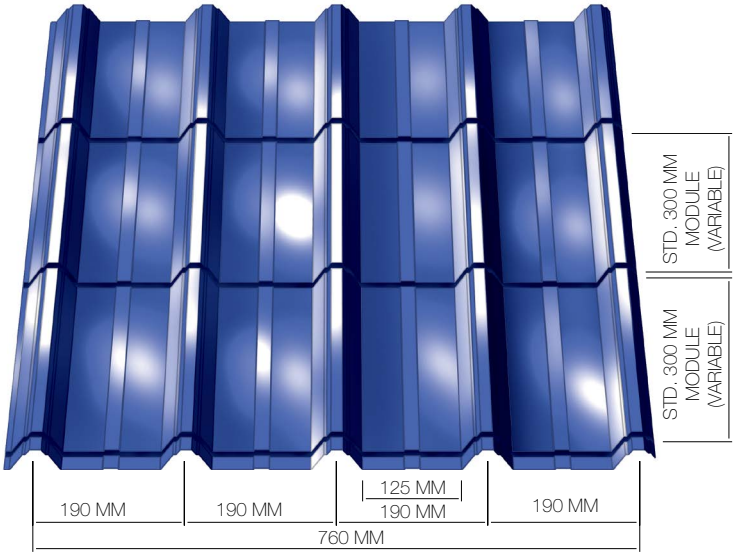
KAWA HOMAGE

The **KAWA** HOMAGE is a 5-corrugation profile offering the benefits of a long length roof with the aesthetics of roof tile appearance. It is ideally suited for residential and commercial buildings.

ADVANTAGES

- The long length sheets eliminate the need for multiple end laps. This eliminates any potential leaks through the roof.
- Shorter installation time is achieved due to the long length sheets, resulting in significant reduction in labour costs.
- The lightweight steel sheets require only a light supporting structure or less supporting members, thus reducing the overall building cost.
- With custom cut long length sheets, there is no wastage at end laps.
- The rugged corrugations of the **KAWA** HOMAGE profile make the roof distinctively attractive.

ISOMETRIC VIEW



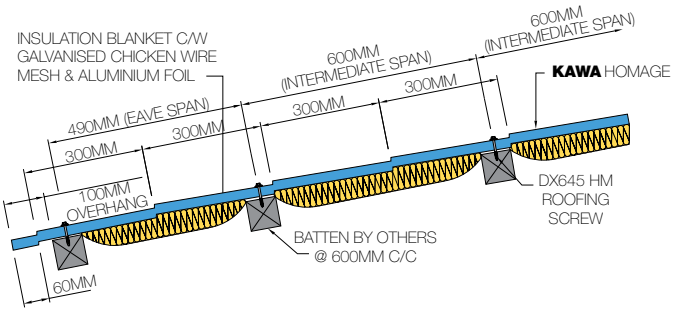
KAWA HOMAGE
Specification

DIMENSIONS				
Overall Width (mm)	Nominal 820			
Effective Cover Width (mm)	Nominal 760			
Rib Height (mm)	25			
Step Depth (mm)	9			
Step Module (mm)	Standard of 300*			
Maximum Length (mm)	Recommended maximum of 6000			

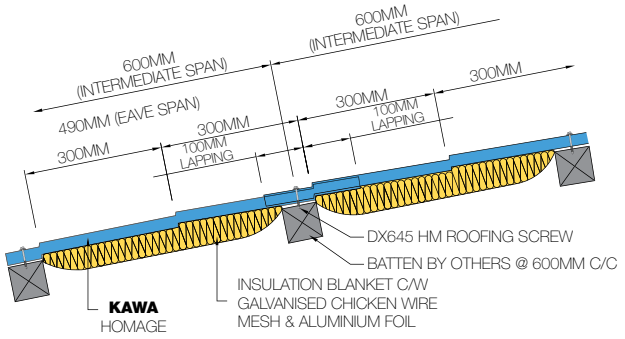
MATERIAL	Steel			
Base Steel Thickness (BST), (mm)	0.35 'E'	0.42 'E'	0.48 'E'	*0.60 'E'
PROFILE WEIGHT				
Mass per Unit Area (kg/m²)	3.48	4.15	4.71	5.84
Mass per Unit Length (kg/m)	2.65	3.15	3.58	4.44
Area per Metric Tonne (m²/tonne)	286.97	241.23	212.23	171.09

* Variation on request
"E" = High Tensile Steel (550 MPa)

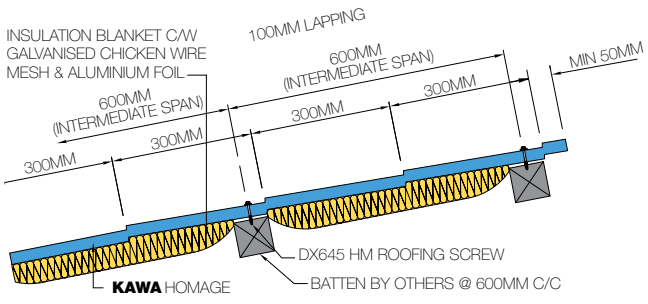
KAWA HOMAGE
SECTION VIEW



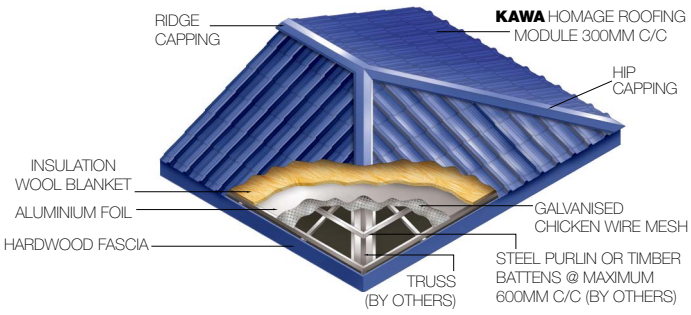
PROFILE AT THE EAVE



PROFILE AT END LAP JOINT



PROFILE AT THE RIDGE



TYPICAL **KAWA** HOMAGE ASSEMBLY

Roof Pitch

The minimum recommended roof pitch for the **KAWA** HOMAGE profile is 7 1/2˚.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 7 1/2˚ roof pitch, and a minimum 200 mm end lap for a roof pitch exceeding 7 1/2˚. Ensure watertightness by applying a good sealant to the end lap.

scan for installation procedure

KAWA HOMAGE
Projects Reference

KAWA R805
Cost Effective and Functional

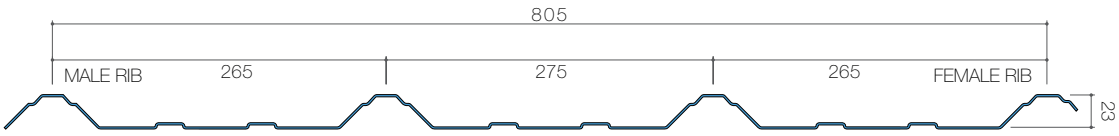
KAWA R805

The **KAWA** R805 is a 4-corrugation roof and wall cladding profile. Each corrugation incorporates a reinforcing web to give the profile extra strength. The custom cut sheet can be applied to industrial buildings and as extensions to residential buildings.

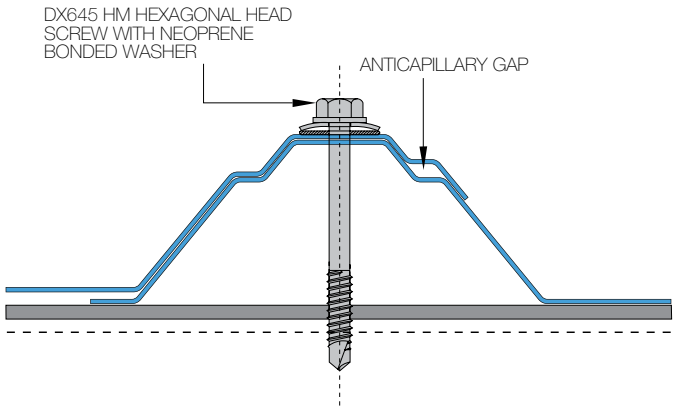
ADVANTAGES

- Designed to be especially cost effective and functional in application.
- Aesthetically attractive profile with reinforcing web on the corrugations spaced by wide pans, making it uniquely distinct from other roofing.
- Steel sheets are strengthened because of corrugations. With the additional reinforcing web, the strength of the **KAWA** R805 profile is further enhanced.

SECTION VIEW



SIDE LAP



KAWA R805
Specification

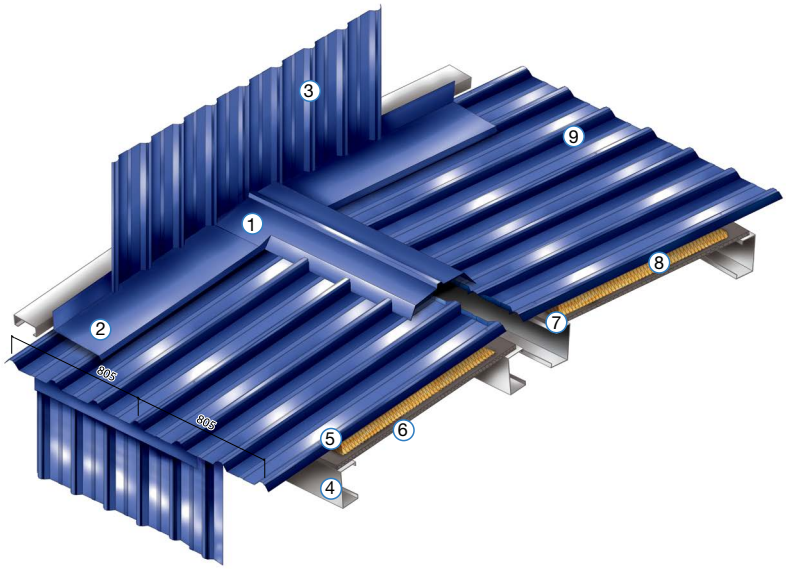
DIMENSIONS					
Overall Width (mm)		Nominal 855			
Effective Cover Width (mm)		Nominal 805			
Rib Height (mm)		Nominal 23			

MATERIAL		Steel			
Base Steel Thickness (BST), (mm)		0.35 'E'	0.42 'E'	*0.48 'E'	*0.60 'E'
PROFILE WEIGHT					
Mass per Unit Area (kg/m²)		3.23	3.91	4.45	5.52
Mass per Unit Length (kg/m)		2.60	3.15	3.58	4.44
Area per Metric Tonne (m²/tonne)		309.30	255.51	224.79	181.22
DISTRIBUTED LOAD CAPACITY OVER CONTINUOUS BEAM FOR THE KAWA R805					
Span (m)					
0.8	Safe Load (kg/m²)	645	774	885	1106
	Deflection for Above Load (mm)	3	3	3	3
1.0	Safe Load (kg/m²)	413	496	566	708
	Deflection for Above Load (mm)	5	5	5	5
1.2	Safe Load (kg/m²)	287	344	393	492
	Deflection for Above Load (mm)	7	7	7	7
1.4	Safe Load (kg/m²)	211	253	289	361
	Deflection for Above Load (mm)	10	10	10	10
1.6	Safe Load (kg/m²)	161	194	221	277
	Deflection for Above Load (mm)	13	13	13	13
1.8	Safe Load (kg/m²)	127	153	175	219
	Deflection for Above Load (mm)	16	16	16	16
2.0	Safe Load (kg/m²)	103	124	142	177
	Deflection for Above Load (mm)	20	20	20	20
MAXIMUM RECOMMENDED SPACING OF SUPPORTS FOR THE KAWA R805					
Roof Application					
Single Span (mm)		850	900	950	1050
End Span (mm)		1000	1100	1200	1250
Internal Span (mm)		1200	1250	1350	1450
Free Cantilever (mm)		200	225	250	275
Wall Application					
Single Span (mm)		950	1050	1100	1200
End Span (mm)		1150	1250	1350	1450
Internal Span (mm)		1350	1500	1600	1700
Free Cantilever (mm)		200	225	250	275

* On Application only
'E' = High Tensile Steel (550 MPa)

KAWA R805
For Roof & Wall Cladding

1. RIDGE CAPPING (OPTIONAL NOTCHING)
2. FLASHING
3. **KAWA** R805 WALL CLADDING
4. ROOF PURLIN
5. SCREWS
6. HEXAGONAL GALVANISED CHICKEN WIRE MESH
7. ALUMINIUM FOIL
8. INSULATION
9. **KAWA** R805 ROOF SHEET



Roof Pitch

The minimum recommended roof pitch for the **KAWA** R805 profile is 3˚. For sheet lengths greater than 31 metres, the pitch should be increased by 1˚ for every 5 metres of additional length.

End Laps

Should end laps be inevitable, have a minimum of 250 mm end lap for a 5˚ roof pitch and below, and a minimum 200 mm end lap for a roof pitch exceeding 5˚. Ensure watertightness by applying a good sealant to the end lap.

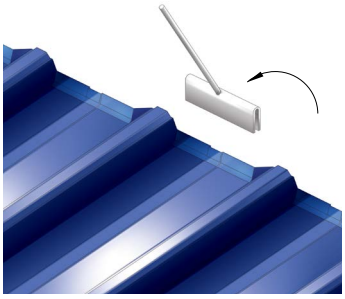


Fig.1: Stop ending of **KAWA** R805

OPTIONAL

Stop Ending & Lipping

Stop ending sheets prevent water from entering the building through the flashing or capping. It is done by a turn-up tool, turning up the tray between crests at the ridge end of the sheet (Fig.1). Lipping is a process whereby a turn-down tool is used to turn down the tray between crests at the eave end of the sheet (Fig.2). Lipping prevents water from being driven into the building by wind or capillary action. Both of these operations can be carried out before or after the installation of the sheets. In the case of the latter, ensure that sufficient clearance is available for the movement of the turn-up/turn-down tool. It is recommended to lip pans of all sheets that have a slope less than 5˚.

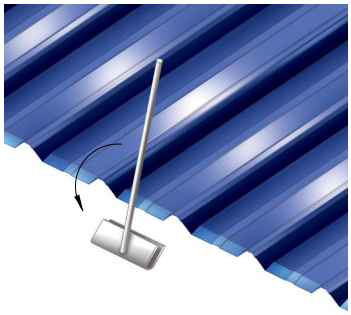


Fig.2: Lipping of **KAWA** R805

GENERAL INFORMATION & PRACTICAL ADVICE **ON USING STEEL PRODUCTS**

GENERAL COMPATIBLE NOTES → LEAD, COPPER,STAINLESS STEEL (NOT LIMITING TO OTHER RELATIVE CATHODIC METALS) ARE INCOMPATIBLE WITH COATED STEEL (EG. ZINCALUME® STEEL & COLORBOND® STEEL). AVOID CONTACT OF COATED STEEL WITH UNPROTECTED STEEL OR TREATED TIMBER AND INSIST ON THE USE OF COATED STEEL PURLINS AND GIRTS.

Specifications of **KAWA** roof and wall cladding sheets

Material	**KAWA** roof and wall cladding systems are available in commercial quality G300 and high tensile G500 grade of coated steel.
Coating	Aluminium/Zinc alloy coated steel substrate with minimum coating mass of 150g/m2 (AZ150), finished in either bare (i.e. ZINCALUME® Steel) or prepainted (i.e. COLORBOND® Steel)
Dimension	Can be made to a continuous sheet length of 25 metres in the factory for transportation to site. For longer sheet length, the roll forming machine can be brought to the site for **site-forming**, provided the required quantity is sufficient.
Delivery & Transportation	• All roofing sheets and accessories leaving the factory are strapped together in bundles. • The bundles of roof sheets are clearly labelled describing the contents. • Upon arrival at job site, all bundles and accessories are inspected for damage, corrosion or exposure to moisture. • In the event of panel exposure to moisture, affected panels must be dried immediately to prevent deterioration in performance.
Handling and Storage	• The unloading and handling of products are as important as the installation process itself. • It is essential that the bundles remain banded at all times prior to installation. • Where possible, lifting of bundles is to be done at its centre of gravity and never by the banding. • Lifting of bundles with a crane must be carried out using a spreader bar of suitable length. • In the event of a forklift being utilised for lifting, ensure the load of the bundle is centred on the forks and that beforehand, the forks are spread to their maximum spacing. • Extra precautions are taken when handling individual sheets so as to avoid damaging the sheet coating or buckling of the sheet. • Storage of sheets should only be for a short period of time as it is good roofing practice for sheets to arrive at site just-in-time for installation and, whenever possible, under a covered structure. • The location of the storage area should be accessible and as close as possible to the installation site to minimise handling of the bundles. • Bundles should be stored off the ground, enabling air circulation beneath the bundle and to prevent rising water from seeping into them. • Bundles should be slightly elevated at one end, thereby permitting moisture run-off from the top of the bundle or from between sheets. • As protection offered by water-resistant paper is not adequate for harsh weather conditions, a waterproof cover should be laid over the bundles, allowing air to circulate under the cover.

EXCLUSIVE COATED STEEL MATERIALS **SUSTAINABLE, DURABLE AND RECYCLABLE**

Unison® uses COLORBOND® steel and ZINCALUME® steel for all **KAWA** products, manufactured only by NS BlueScope Malaysia which undergoes stringent quality control and testing procedures.

Zincalume®

ZINCALUME® steel is a zinc/aluminium alloy-coated steel which comprises 55% aluminium, 43.5% zinc and 1.5% silicon with minimum coating mass of 150g/m2 (AZ150). It offers excellent corrosion resistance and can outlast galvanized steel by up to four times, depending on the environment.

ZINCALUME® steel is certified by SIRIM and meets the Malaysian Standards MS 1196 and Australian Standards AS 1397, whereby durability and performance is backed by superior material warranty*

Material warranty offered by NS BlueScope Malaysia

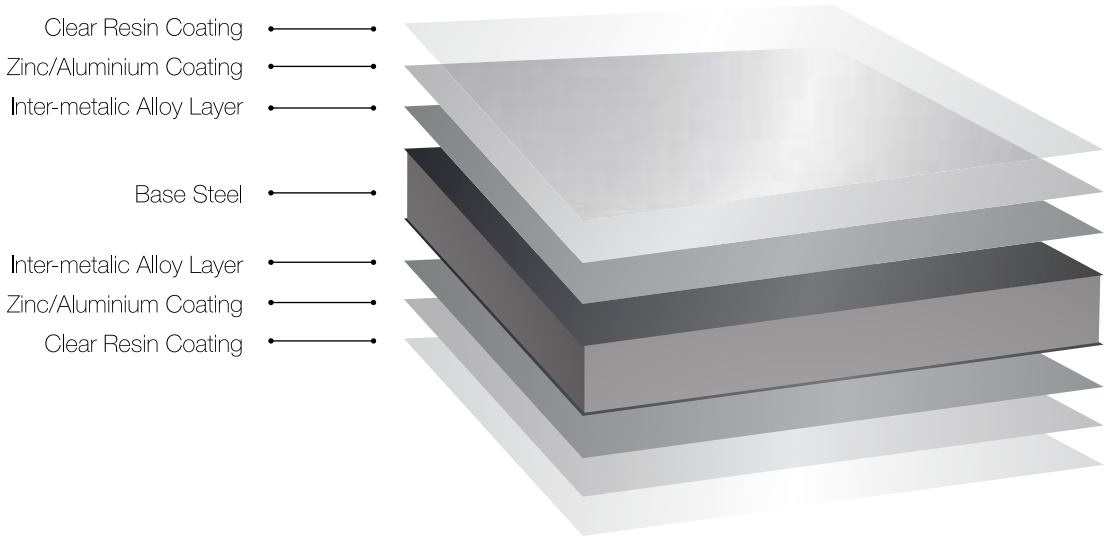
√ Warranty* against corrosion perforation for up to 25

Product Benefits

- Durable, strong and superior corrosion resistance against harsh environment conditions
- Lightweight for easy handling
- Thermal reflectivity
- Excellent in design for truly individual designs
- Clear resin coating resists scuffing and handling marks
- Non-combustible and conform to BOMBA class “O” with greater safety

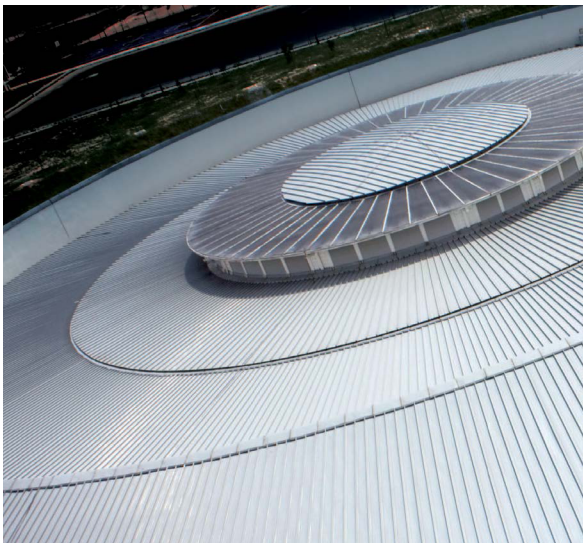
* Terms and Conditions Apply

CROSS SECTION OF ZINCALUME ® STEEL



EXCLUSIVE COATED STEEL MATERIALS **SUSTAINABLE, DURABLE AND RECYCLABLE**

Field proven for their durability and quality with material warranties* backed by NS BlueScope Malaysia, there is an assurance that the **KAWA** brand is a guarantee of quality.



Colorbond®

COLORBOND® Steel is incorporated with ZINCALUME® Steel substrate with superior corrosion resistance performance. BlueScope's proprietary paint system provide longer lasting colour and resist to chipping, peeling and cracking. It also resists tropical staining.

COLORBOND® Steel is lightweight, thus easy to handle. Roofs made from COLORBOND® steel has relatively High Solar Reflectance Index (SRI), therefore absorb less solar heat.

Available in a wide range of interior/ exterior building applications, it conforms to the requirements of AS/NZS 2728 and MS 2383, and certified by SIRIM.

Material warranty* offered by NS BlueScope Malaysia

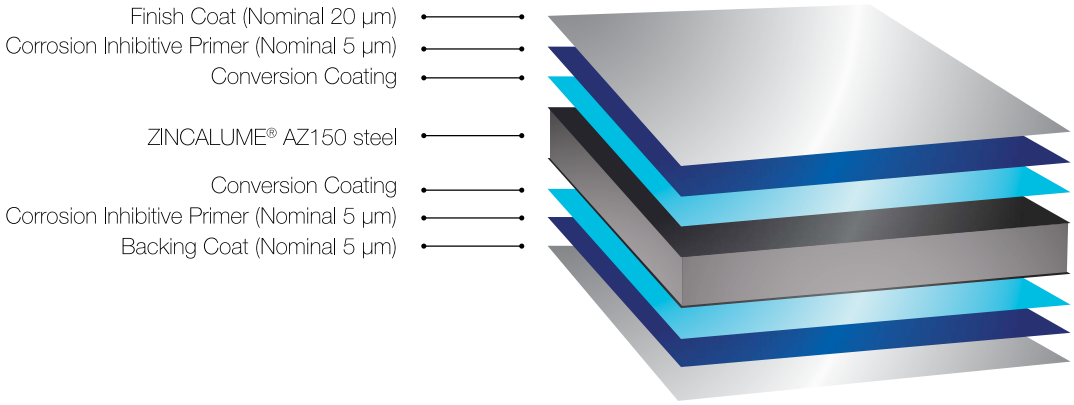
- √ Warranty* against corrosion perforation for up to 25 years
- √ Warranty* against fading for up to 10 years
- √ Warranty* against flake and peel for up to 15 years
- √ Warranty* against dirt staining for up to 5 years

Product Benefits

- Wide variety of colours and excellent colour retention
- Excellent corrosion resistance against harsh environment conditions
- Clean technology to prevent dirt and tropical staining
- Thermally efficient – Heat resistant for greater thermal comfort
- Resists cracking, chipping and peeling
- Flexibility of design that suits any roofing designs

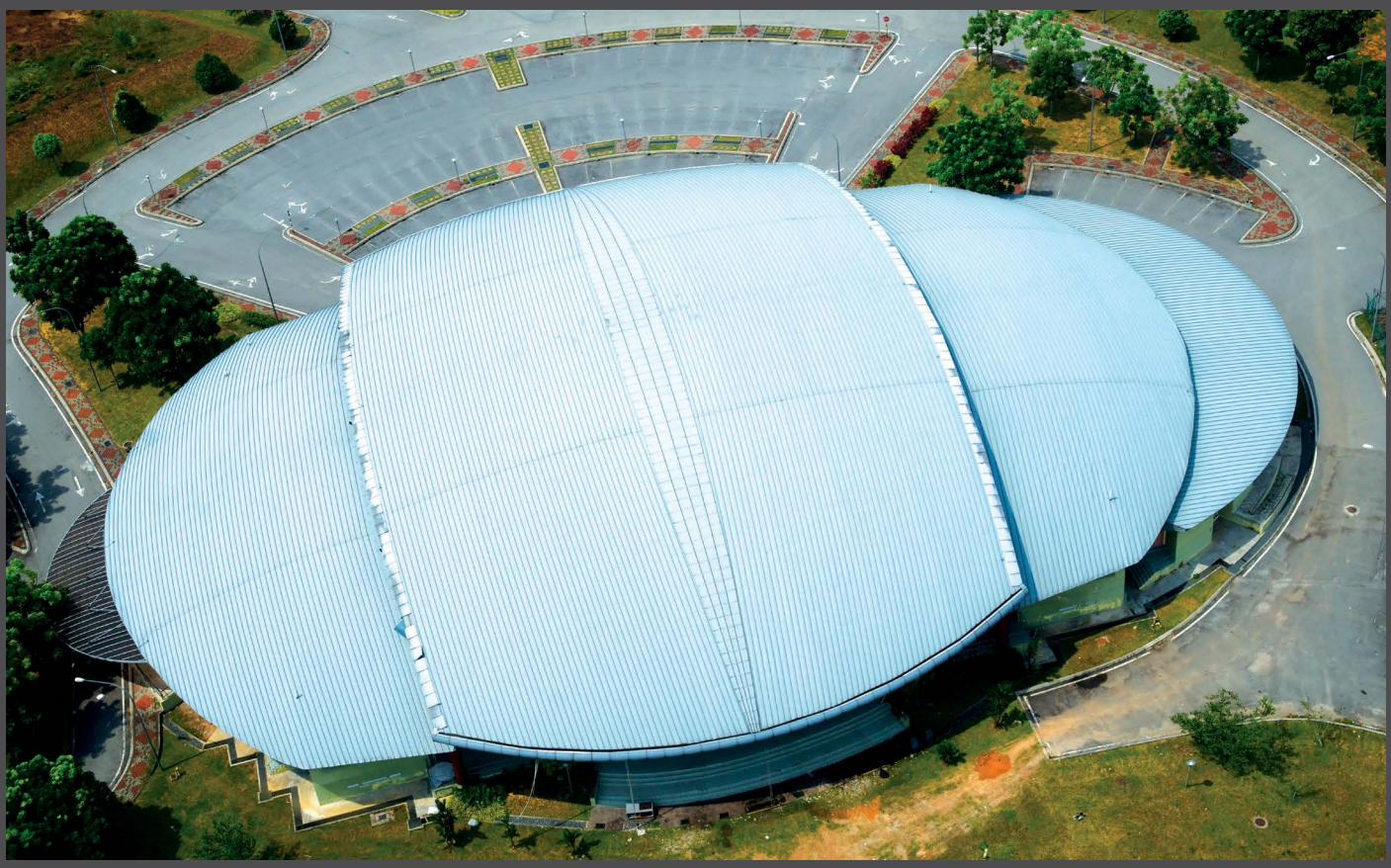
* Terms and Conditions Apply

CROSS SECTION OF COLORBOND® STEEL



PROJECT
REFERENCES


KOLEJ RAFFLESIA



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