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Metal Roofing Systems

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ASHZIP™

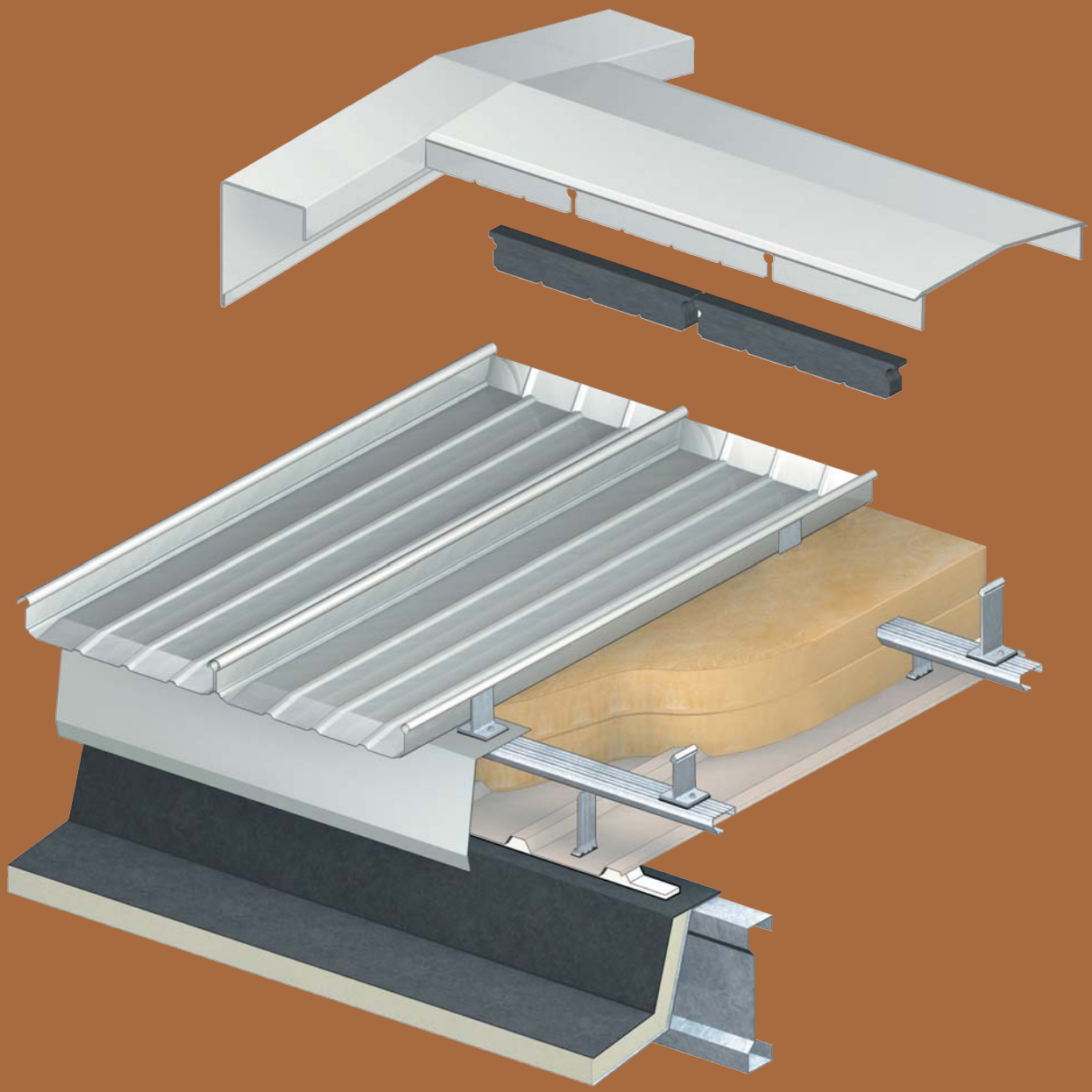
FLEXIBLE STANDING SEAM
ROOFING SYSTEMS

Design Guide

a Hill & Smith Holdings Plc Company

Ash&Lacy
building systems

Contents



Introduction

Standing seam roofing systems are renowned for their outstanding aesthetic and performance characteristics and have been used extensively throughout the public and private sectors in the UK for over 25 years.

The Ashzip standing seam roofing system represents excellent value without any compromise on quality, service, choice or the comprehensive range of design and detailing options available. By incorporating other high performance Ash & Lacy building envelope products into the roofing system, compatibility is ensured between the individual components. Manufactured using the latest state-of-the art design and production equipment and available in a variety of materials and finishes, Ashzip, has proved to be an unbeatable choice amongst both specifiers and contractors.

Mobile rollforming units provide efficient UK and international coverage and offer the option of manufacture in a factory environment or on site (depending on sheet lengths required). To achieve convex and concave curves to tighter radii than site flexing Ash & Lacy have invested in mobile curving technology, which like the containerised mobile rollforming units, can curve the Ashzip sheets on site or in the factory. To complete the range of options Ashzip can be taper roll formed to create a radial roof on plan and provide attractive architectural features irrespective of direction of lay.

Materials & finishes

The Ashzip external profile is available in a wide range of materials including 3000 series aluminium, G275 pre-painted galvanised steel, copper and zinc. Finishes available include plain stucco embossed, PVF2/PVdF and ARS on aluminium, or Plastisol on steel in the full range of BS and RAL colours. Colour swatches, colour cards and sheet samples are available upon request. Special design considerations are required for zinc roofs and softer materials.

Stucco embossed & plain mill finish aluminium

0.9mm thick plain mill finish & stucco embossed aluminium is normally expected to last the life of the building without maintenance – BS5427: 1976. BBA certificate 06/4301 states 40 year life expectancy.

PVF2/PVdF on aluminium

With excellent durability and colour stability, this finish usually provides a long-term aesthetic life in excess of 20 years on an aluminium substrate. As the aluminium does not rust and most shades have an even colour change that does not peel, it is feasible that some applications may never need attention, other than simple regular maintenance.

ARS (Abrasive Resistant System) on aluminium

An abrasion resistant coating for aluminium with good handling characteristics and advantages for certain applications. 20 years aesthetic life span can be achieved.

200 microns Plastic Coatings on steel

The established high performance coating on pre painted steel. Corus HPS 200 ULTRA is available with a projected lifespan of up to 40 years.

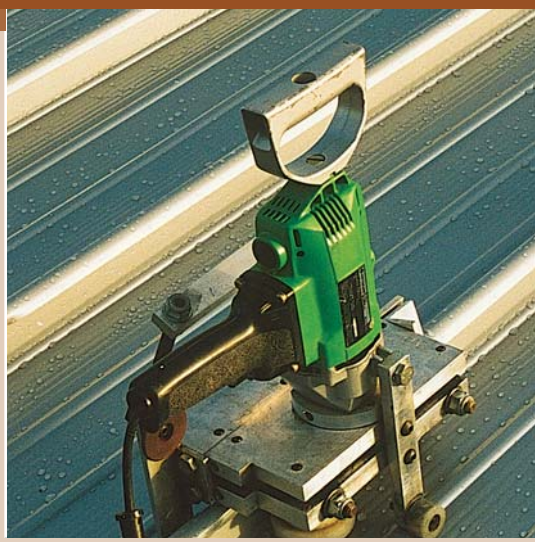
Durability

The durability of a metal coating is determined by many factors such as colour, location, environment and building use. The information given above is intended as general guidance for the British Isles only. For project specific information, please contact Ash & Lacy.

Aesthetics

The building designer should remember that scratches and minor abrasions to the coating can occur during installation. Within reason these marks do not affect the warranty and as such are not considered a problem when using aluminium. Careful thought should be given to the specification if the Ashzip sheets can be seen from within 2m.

System overview

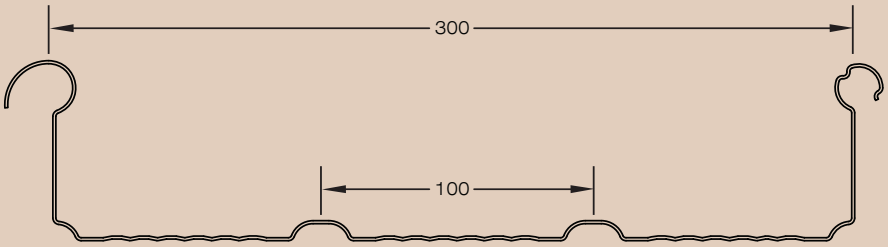


Designed for roof pitches as low as 1.5°, Ashzip™ is secretly fixed by engaging an anchor headed halter within a keyhole standing seam rib. The keyhole is then closed tightly around the halter by running a zipping machine along the rib. When designing a roof the following minimum pitches should be observed.

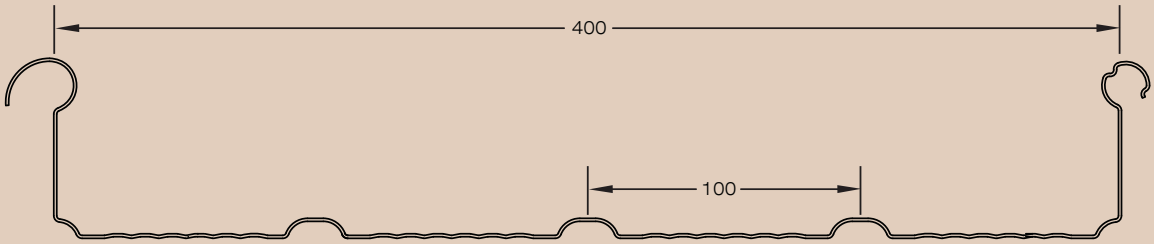
Application	Minimum Roof Pitch
Continuous sheet from ridge to eaves	1.5°
Sheet with welded lap	1.5°
Roof with welded roof penetrations*	1.5°
Zip-up rooflights ridge to eaves	1.5°
Rooflights lapped onto Ashzip**	1.5°
Curved roofs	N/A

** Minimum upstand of 150mm ** 1.5˚ for full slope length applications*

Note: When taking into account minimum roof pitches, the designer/contractor should ensure that depths of flashings and other component materials are considered to prevent ponding at gutter locations. This can be achieved by the use of a lower height Ashgrid support bracket or by dropping the level of the last support by 5mm at the eaves location (the latter being the preferred option). For further information please contact our technical department or refer to our standard details.



(Will require a 150mm liner module or secndary Ashgrid spacer)



Typical Construction

The Ashzip roofing sheets are placed onto halter brackets and then locked into position using a powered zipping machine with each following sheet hiding the seam overlapping the halter. Fasteners are positioned below the roof covering at the base of the halter and are therefore concealed from view. Movement of the top sheet due to thermal expansion is catered for by the sliding action over the head of the halter bracket, in conjunction with a fixed point at the highpoint. Any joints or apertures in the roof should have a minimum upstand of 150mm and be designed to prevent any water ingress, and to also allow thermal movement to occur.

Profile Widths

The Ashzip standing seam profile is available in cover widths of 300mm and 400mm. Sheets can also be produced in a tapered format to create a radial roof on plan or as faceted elements within roof plans which curve more gradually.

Non standard profile widths can be produced in special cases. Non standard widths can not be pre-curved.

Ashzip standing seam profile is produced from 0.9mm thick, 3000 series Aluminium. It is aso available in other materials, such as colorcoated steel, zinc, copper, etc

Features & benefits

- **Aluminium grade used is 3000 series and a specified true thickness of 0.9mm**
- **BBA approved to incorporate 2006 thermal expansion testing requirements**
- **Full height thermal halters available**
- **Halter spacing constant, irrespective of curvature of the sheet**
- No penetrations through the face of the sheet, all fixings are below the sheet
- Fully supported by a range of complimentary products
- Technical service to assist with specification and detailing
- Full compliance with Building Regulations/Technical Standards
- Specialist site welding service available
- Insurance backed warranty available
- Produced in the factory or on-site to accommodate all requirements
- Can be naturally curved or pre-curved depending on required radius
- Available in natural finish, stucco embossed, painted aluminium, plastisol, PVDF, polyester coated steel as well as zinc, copper and stainless steel
- Compatible fall arrest systems available
- Green roof and bio-diverse roofs available, offering the lightest system available, thus minimising cost of support steelwork
- Tapered and tapered curved sheets available
- Outstanding resistance to wind uplift
- Range of acoustic roof options available

Conception

Ash & Lacy's highly qualified technical personnel can assist with every aspect of the process from initial conception to final completion. Our specialised design teams are equipped with the know-how and 3D modelling software to find solutions to even the most technically complex or architecturally inspired constructions. Think of them as project partners.

Compliance

Achieving compliance with the new Building Regulations and Standards involves a combination of the right products and correct design. We can provide both to ensure correct standards in areas such as insulation, acoustics, load carrying, wind uplift, condensation and airtightness.

Construction

On-site surveys and experienced personnel for the on-site rollforming service ensuring that the construction process runs as smoothly as possible. A national network of locally based specification personnel means rapid advice and assistance on-site is only a phone call away.

Aesthetics

Aesthetics

A building is often the external face of the organisation it accommodates. Alongside performance, aesthetic expectations are nowadays of paramount importance. With its attractive narrow ribs at wide centres, Ashzip brings the traditional benefits of metal roofing installation speed, durability and security, without an "industrial" appearance. A wide palette of colours and finishes are available and the sheets can be tapered or curved to suit the design requirements.

The evolution of architecturally pleasing roof and wall cladding systems emphasises the importance of equally sophisticated perimeter detailing. From initial concept to project completion, our quality of sheet metal fabrication skills, technical competence, technology and trusted experience ensure that an Ashzip roofing solution is best placed to achieve the highest aesthetic standards.

Curved roofs

Ashzip can be convex or concave curved or "wave formed" (the latter are configurations incorporating both convex and concave curves in one profile sheet). So-called "hockey stick" sheets, with one end partially curved and a straight tail to the profile sheet, can also be formed. Ashzip sheets will self-curve to approximately 40m convex radius depending on material, thickness and profile width. For radii beneath this figure, they can be mechanically smooth curved down to very tight radii, either at the factory or on site, refer to the curving section of this document.

Tapered profiles

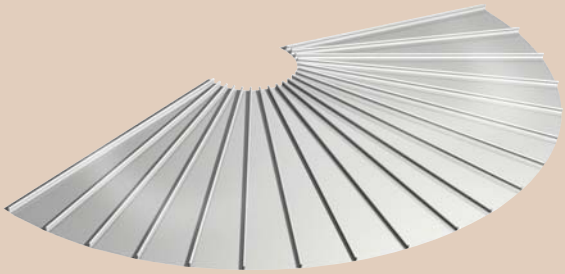
Ashzip may be manufactured in tapered sheet formats enabling a wide range of curves on plan and radials to be achieved in conjunction with standard parallel sheets. Tapers can be produced for both left to right and right to left lay direction and individual sheets may be produced up to = 20m long, maximum width = 500mm, minimum width = 250mm. The width of tapered sheets should be calculated by the fixing contractor against full structural steelwork drawings. Assistance can be provided by Ash & Lacy Technical Department at the design stage. As discrepancies in the steelwork can occur, it is recommended that the actual steelwork dimensions are checked against drawings before the setting out of the Ashzip halters and subsequent installation begins.

Minimum/Maximum Sheet Widths

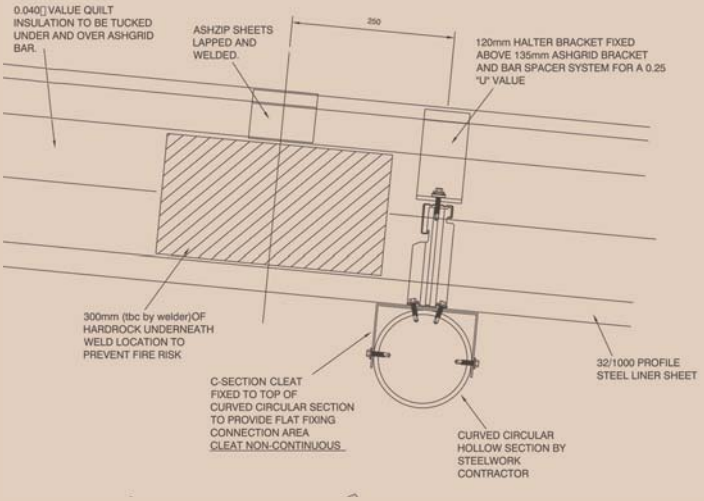
When calculating the cover width of tapered sheets, widths of between 400 or 500mm (wide end) and 250mm (narrow end) will generally be used to provide optimum usage of flat sheets and to keep costs to the roofing contractor to a minimum. Cover widths greater than 400mm will need to be fully supported by rigid non-combustible insulation slabs. Once the cover width becomes less than 400mm, there is no requirement for the rigid insulation to support the pan of the sheet. Sheets wider than 500mm can be manufactured, but specific fixing methods will have to be adopted. Please refer to the Ash & Lacy Technical Department for further information.

If the plan radius of the building does not suit the minimum and maximum sheet sizes there are two options:

1. Special width sheets can be produced subject to production checks and structural connection details.
2. Sheets can be fitted in a layered format incorporating the minimum and maximum sheet widths. In some cases the seams of the Ashzip will not always line up which is governed by the internal diameter/radius and how many times the Ashzip sheet must be split. Joints are then site welded. See photo opposite.



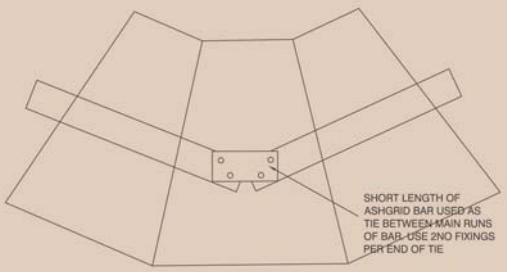
When using tapered sheets the Ashzip halters are setout along radial supports following the plane of the roof. Liner sheets are not supplied tapered and will have to be cut to suit on site, and the edges covered with a flashing trim along the line of the rafter. The Ashgrid spacer support system should be ordered with short bar lengths(but no shorter than 2m). If this does not fit within tight curves then top hat sections should be incorporated to provide a more rigid support system.



Welded Joint for Tapers

A 300mm strip of high density Rockwool Hardrock insulation (or similar approved non-combustible) should be positioned underneath the welded joint. This provides additional support and rigidity whilst the Ashzip tapered sheets are being site welded and subjected to highlevels of foot traffic. In most applications, tapered roofs will incorporate an Ashgrid spacer support system or top hats to provide flexibility in setting out. The details below are for relatively shallow radii on plane to ensure continuity of the Ashgrid.

For suitability of use for specific projects please refer to the Ash & Lacy Technical Department for design assistance.



Tapered profiles

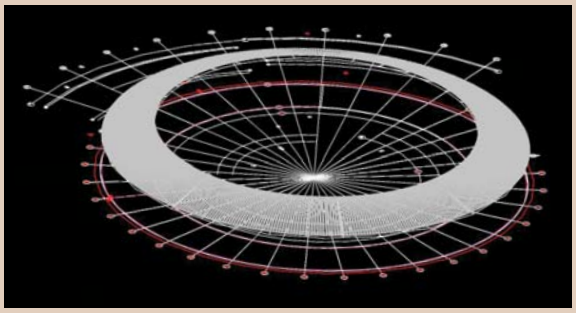


Fig 1

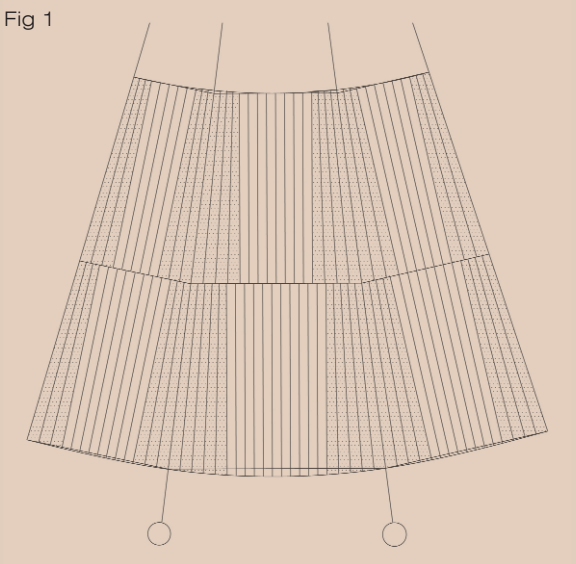
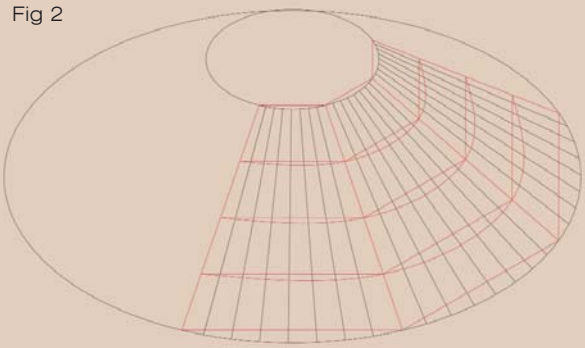


Fig 2



Straights and Tapers

On buildings that have relatively shallow radii on plan the appearance of a curve can be achieved by using a combination of straight and tapered sheets together with closer rafter locations (see diagram Fig 1).

On this particular layout there are non-symmetrical bays and the straight Ashzip sheets are laid out from the approximate centre of each bay perpendicular to the main eaves and ridge beams.

The roof areas at the ends of the bays are taken up with the tapered Ashzip sheets and are calculated on the basis of minimum and maximum sheet size parameters. If one sheet falls below the minimum or is larger than the maximum, then the straight Ashzip sheets will have to be adjusted to suit or be replaced by more tapered Ashzip sheets. This will depend on the angles, of the structure below as the tighter the angles the more the facetted effect will appear. The Ash & Lacy Technical Department is available to offer assistance to designers if required.

Tapered Ashzip on Straight Purlins

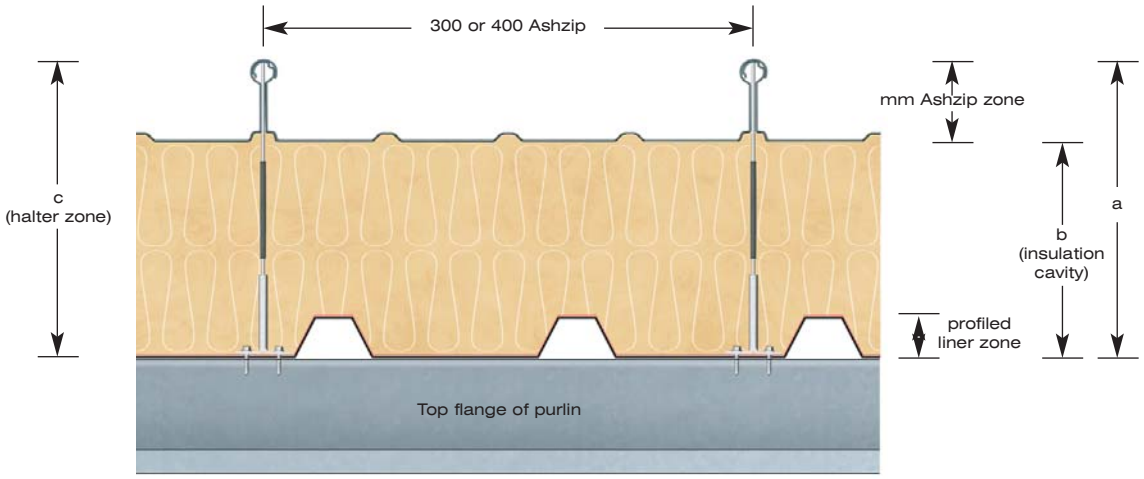
The use of tapered Ashzip over straight purlins will not always form a perfect curve around the roof i.e. a conical formation between rafters, as the purlins create a facetted effect at the hip rafter locations. The same principle would apply to concave tapered roofs, as the natural effect of a taper would be for the sheets to curve away from the straight purlins.

On the illustration (see diagram Fig 2) the red lines represent the purlins and rafters. The black lines represent the tapered Ashzip sheets projecting away from the supports. The same effect would also occur where structural decks are used as they would lie flat between rafters. The Ash & Lacy Technical Department is available to offer assistance to designers if required. This effect becomes more apparent on steeper pitches and to avoid this, pre-curved chs sections should be used.

U-values

The thermal performance of the Ashzip standing seam roofing system has been calculated by taking into account the effects of two and three dimensional heat flow by using computer software to model the building structure.

The following tables detail the heights/thickness of the various components required to achieve the desired U-value. However, bespoke calculations can be provided where required. Please contact the Ash & Lacy Technical Department for more information.



Dimension a
Overall height of system from top flange of purlin to the crown of the Ashzip rib.

Dimension b
Overall height of insulation cavity from top of purlin to the pan of the Ashzip profile.

Dimension c
Height of Ashzip halter

Full Height Halter Fixings
(as required) BMLS25S16

U-value W/m2K	0.25	0.20	0.16	0.13
Insulation Material	Rock/Glass fibre =0.040	Rock/Glass fibre =0.040	Rock/Glass fibre =0.040	Rock/Glass fibre =0.032
Dimension a - Overall height of complete system	247	297	347	347
Dimension b - Overall height of insulation cavity	180	230	280	280
Dimension c - Height of Ashzip halter	245	295	345	345
Thickness of insulation prior to compression to fit b	200	250	300	300

Note: The above are calculated with LAMBDA 90/90 values and Ashzip 400 at 1500 purlin centres. Wider purlin spacings will reduce the insulation thickness and overall system height, as may further improved 'K' values. Please consult our technical department for the most up to date information.

Regulatory changes

Regulatory changes and the designers' requirement to produce a more environmentally friendly building, mean that thermally efficient and simple to install systems are a requirement within the construction industry.

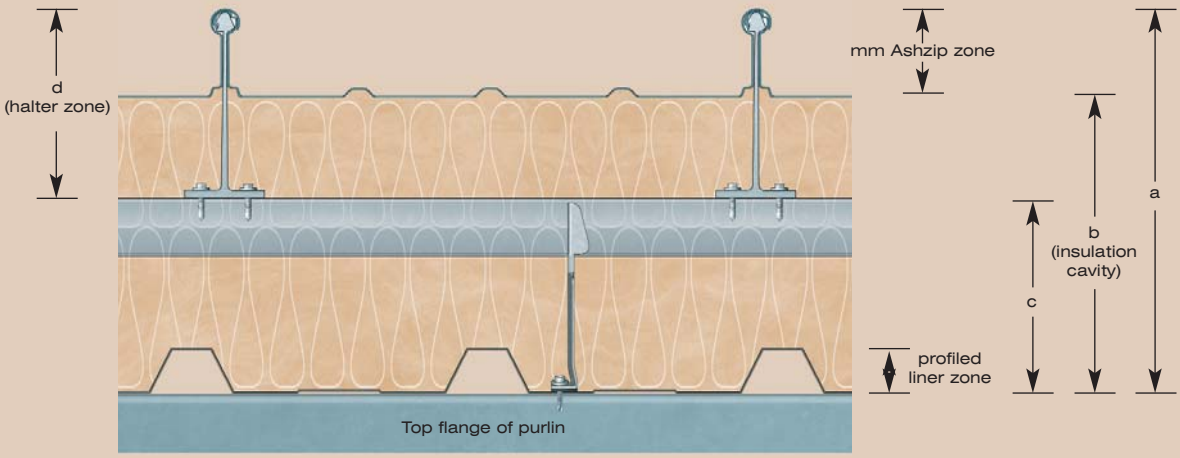
The Ash & Lacy full height halter caters for both of these requirements. A 0.16 U-value and better can be achieved using a single spacer component. This is achieved by a fully engineered component utilising a stainless steel element which is a low conductor of heat. This means that a separate thermal barrier pad is not required under the halter base.

Insulation depths

The engineered halter with it's small cross sectional area and careful selection of materials, ensures minimal thermal bridging between the outer and inner sheets whilst providing high levels of structural performance.

U-values

Halter with Bar & Bracket Construction



U-value W/m2K	0.25	0.20
Insulation Material	Rock/Glass fibre =0.040	Rock/Glass fibre =0.040
Dimension a - Overall height of complete system	255	300
Dimension b - Overall height of insulation cavity	190	235
Dimension c - Height of Ashgrid engineered spacer	135	180
Dimension d - Height of Ashzip halter	120	120
Thickness of insulation prior to compression to fit b	200	200

Dimension a
Overall height of system from top flange of purlin to the crown of the Ashzip rib.

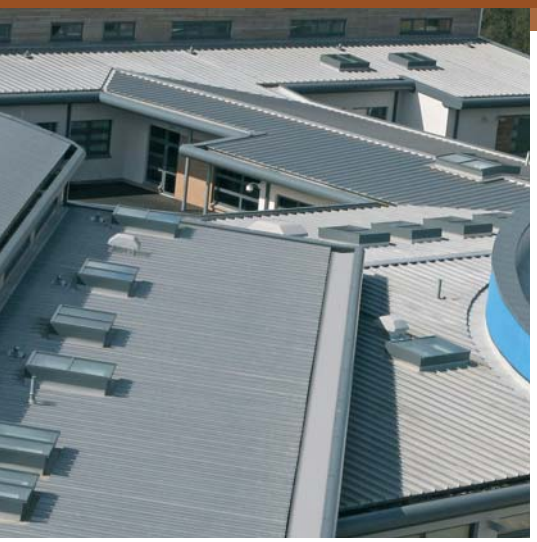
Dimension b
Overall height of insulation cavity from top of purlin to the pan of the Ashzip profile.

Dimension c
Height of Ashgrid Spacer System

Dimension d
Height of Ashzip halter

Extruded Halter
2nd Fixings
BMLSHF38

Insulation



The building should be designed and constructed so that there are no significant gaps in the insulation layer. This applies to all areas, but experience has shown that the biggest problems are always at the junctions and edges of the various building elements (eaves, verges, ridges, hips, valleys, abutments etc.).

In all cases insulation should be layed with staggered laps. Insulation layers in the various building elements must always abut or overlap one another, rather than stopping short of each other.

The C-value (PSI) is the extra heat loss through a junction through lineal thermal bridging over and above the heat loss of the adjoining insulated plane elements (e.g. the main areas of roof and wall). In essence, the C-value is very similar to a U-value, but is expressed per linear metre (W/mK), whereas a U-value is expressed per square metre (W/m^2K). C-values are required for all thermal junctions where they may impede the thermal performance of the main plane elements of the building envelope.

To satisfy the requirements, the C-value for the building fabric must be considered where

$$\alpha = \frac{\Sigma\Psi \cdot L}{\Sigma A \cdot U} = \frac{\text{(sum of heat loss at junctions)}}{\text{(sum of heat loss through plane areas)}}$$

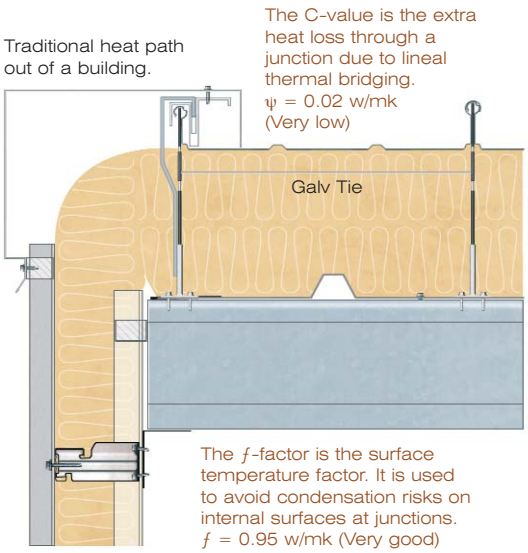
α-value (Alpha) must be less than or equal to 0.10 for non-domestic buildings or 0.16 for domestic buildings. On simple large roofs with comparatively modest perimeter details, thermal bridging will have little impact with a permissible allowance of 0.10. By comparison, a small roof with a relatively high ratio of perimeter detailing to roof area e.g. several hips, valleys, dormers etc may require careful design to remain within the limits of the Regulations.

"Point" thermal bridges caused by penetrations of the insulating envelope, such as protruding girders to support projecting overhangs etc are not currently required to be included in these calculations. ƒ-factors are also needed for these junction details. ƒ is the surface temperature factor and is to be used to avoid internal surface condensation risks. However, perusal of the typical detail ƒ-factors together with the relevant building type internal humidity classification tables suggests that these values are most relevant for high internal humidity buildings.

Ashzip robust details are available for all common typical details. These ensure that there are no significant insulation gaps or thermal bridges at the interface of the various elements. Both the -value and the -factors are illustrated on major details and our technical team is available to provide bespoke assistance.

The responsibility for achieving compliance to the prevailing regulations will normally rest with the developer or contractor, even where the work has been carried out indirectly via a subcontractor. The developer/contractor can provide a certificate or declaration that the works comply with the regulations or obtain one from a suitably qualified, competent person.

For insulation continuity, the certificate must confirm that appropriate design and installation has been carried out to achieve reasonable conformity to the regulations, or that a thermographic survey has shown that the insulation is reasonably continuous over the building envelope and excessive thermal bridging has been avoided.



Moisture

Low/Medium Risk of Moisture Usage

Where there are any difficulties in sealing the laps of the liner profile properly then a proprietary VCL should be used. Generally an Ashflex 265UB vapour control layer can be used with a low capacity to the following specification:-

Water resistance – 530MN.s.g-1 Moisture transmission – 0.5 gM2-24hr

High Risk of Moisture Usage

In some cases there is a high risk of moisture laden air transferring into the insulation cavity. In such cases a high capacity vapour control layer should be used. The VCL should be an Ashflex 360UB to the following specification:-

Water resistance – 43,000MN.s.g-1 Moisture transmission – 0.005gM2-24hr

Low to Medium Risk Levels of Moisture within the building envelope

Product	Colour	Roll size	Roll Weight	Tensile Strength	Moisture Vapour Transmission	Water Vapour Resistance
Ashflex 265UB	Clear, Black/Grey	2mx50m 3mx50m 4mx50m	25.2kg 37.8kg 50.5kg	5.9kN/m	0.4gM^2-24hr	530 MN.s.g-^{1}

High Level Risk of Moisture within the building envelope

Product	Colour	Roll size	Roll Weight	Tensile Strength	Moisture Vapour Transmission	Water Vapour Resistance
Ashflex 360UB	Blue/Grey	1.25mx50m 2mx25m	22kg 17kg	8.0kN/m	0.005gM^2-24hr	43000 MN.s.g-^{1}

General Considerations

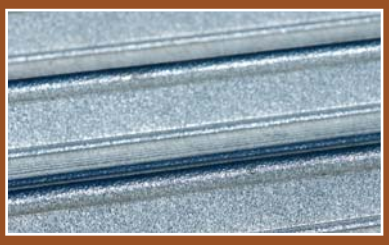
Consideration should be given to buildings where there is a possibility for a large number of people to congregate as high levels of moisture can be created from wet or saturated clothes drying out. This risk is greatly increased in poorly ventilated rooms and buildings. The risk is also high in buildings such as swimming pools where highlevels of chemicals and vapour will be apparent.

In buildings where there is a low risk/level of moisture there may be small areas or rooms where high levels of moisture are present such as a shower room or a kitchen in domestic applications. In these areas a high capacity vapour control layer should be used. Internal moisture transfer should be prevented by mechanical extraction wherever possible.

Care should be taken during the installation of the vapour control layer to ensure that all side laps are sealed correctly. This will reduce the risk of laps being 'blown' and possible failure during air leakage tests.

If a perforated liner or decking profile is used then a high capacity reinforced vapour control layer is required in all conditions.

Construction details



Standard Verge Detail

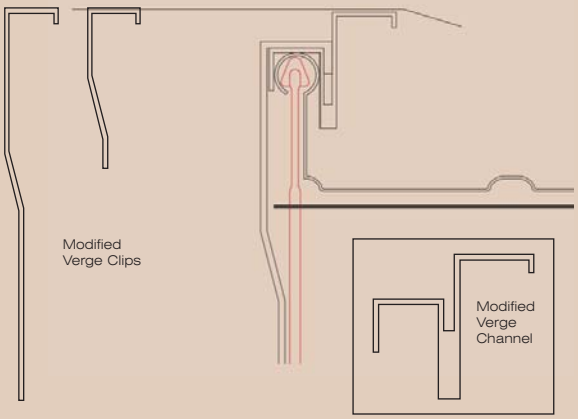
The leading edge seam of the Ashzip is zipped-up and the verge extrusion is then positioned over the seam and holds the sheet into place (the sheet must be zipped up for the verge extrusion to be positioned over the seam). The verge extrusion is secured in place by the verge clip. The verge clip is then fixed through the side of the halter bracket at every halter location along the verge, which again allows the Ashzip sheets to expand and contract.

This simplified verge component allows for ease of installation whilst offering superior load resistance. This component can be pre-curved to a 6m radius, in both convex and concave directions removing the need for cutting and notching on site.

Hip Construction

For Hip constructions special hand turn up tools are supplied. These must be requested at the time of ordering the standard tool kit (or whichever tools are required on the project). Special ridge fillers and shroud closures are available upon request and must be ordered at the same time as standard components. We would advise that if special fillers are required longer lead times should be allowed for manufacture.

Note:
Hip shrouds are not pressed to match the Ashzip profile.

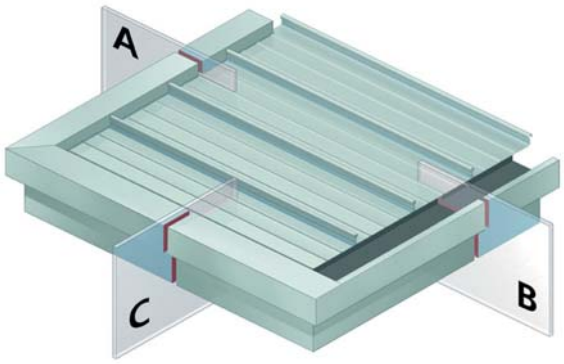


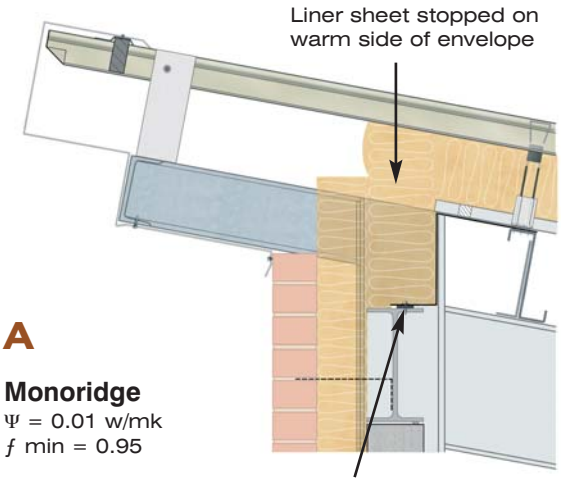
Construction details

Projects frequently include overhangs and masonry. These details are based on 'as built' situations.

They demonstrate outstanding thermal efficiency and incorporate a highly desirable continuous 'line' to the roof perimeter.

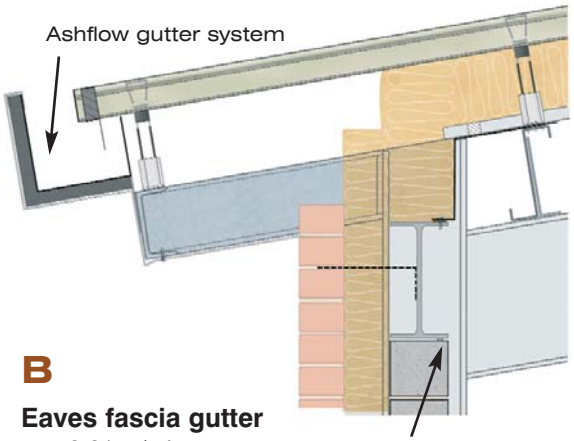
Thermally efficient typical details





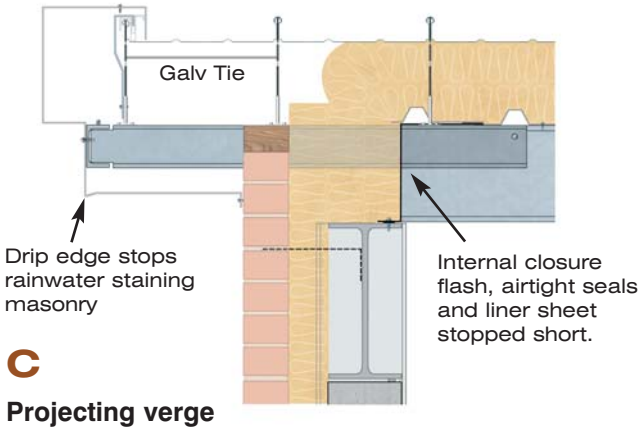
A

Monoridge
Ψ = 0.01 w/mk
ƒ min = 0.95



B

Eaves fascia gutter
Ψ = 0.01 w/mk
ƒ min = 0.95



C

Projecting verge
Ψ = 0.02 w/mk
ƒ min = 0.95

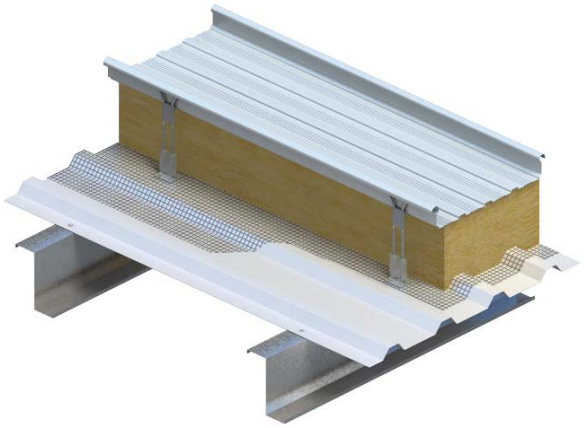
Note: As recommended in BRE Paper IP17/01, the values given are only applicable to the roofing elements which have been calculated in isolation. The adjoining elements are deemed to be adiabatic for this purpose. Changes to the components will have an effect on the given C-values. For example the liner sheets could be taken through to the outside of the envelope but this could increase the values to between 0.25 and 1.10. The steelwork and the sealing between this and the masonry will be by others. As the projecting Structural steel elements are not lineal features, their analysis is not a requirement of Approved Document L.

Construction details

Ash & Lacy have a number of systems tested for sound reduction, absorption and rain impact noise. As well as this we are able to offer advice on differing buildups and insulation types through the use of sound reduction prediction software.

Please contact our technical department to discuss your project requirements.

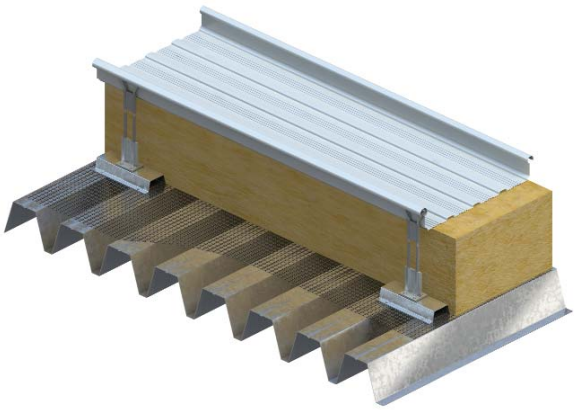
Arrangements & Acoustics



Standard arrangement with liner profile

Installed above light gauge cold rolled purlins using a 0.7mm thick walkable liner profile. A reinforced VCL can be used or alternatively the side and end laps can be fully sealed.

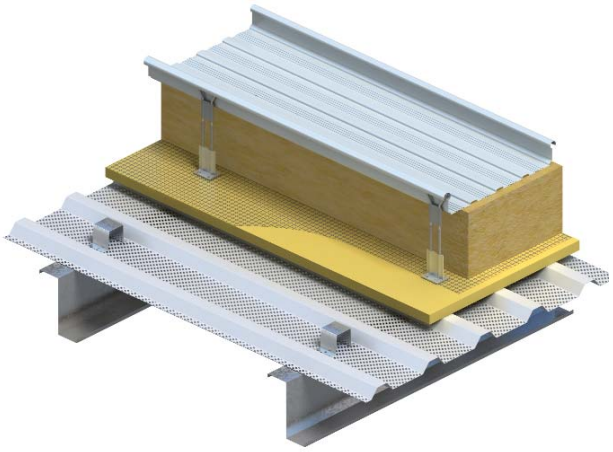
The system typically provides as sound reduction of 40dB with a 0.9mm thick aluminium outer sheets or 44dB with a 0.7mm thick steel outer sheet.



Structural deck arrangement

Structural decks are used in long span applications to replace the requirement for purlins and can span in excess of 8m. We recommend the use of a reinforced VCL with this construction rather than sealing the side and end lap of the deck.

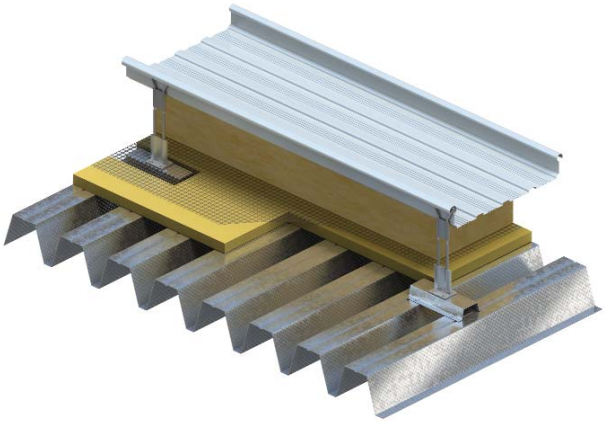
This system typically provides 40dB with a 0.7mm thick deck and aluminium outer sheet. owever with thicker gauges of deck up to 45dB can be achieved using standard insulant and aluminium outer sheet.



Standard arrangement with perforated liner profile

Installed above light gauge cold rolled purlins using a 0.7mm thick perforated liner profile (Pan perforated as standard). A reinforced VCL must be used for this construction.

The system typically provides as sound reduction of 37dB with a 0.9mm thick aluminium outer sheet. For sound absorption the system acheived AW = 0.45 (LM. For a fully perforated liner sheet the system achieved AW = 0.75 (LM).

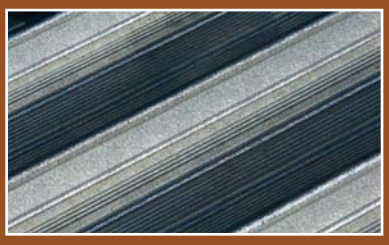


Web perforated structural deck arrangement

Structural decks are used in long span applications to replace the requirement for purlins. A reinforced VCL must be used with this construction.

This system typically provides 37dB with a 0.7mm thick deck and aluminium outer sheet. For sound absorption the system achieved AW = 0.40 (LM) with a web perfirated structural decking profile.

Acoustics



Acoustic performance of the Ashzip standing seam roofing system

This table displays approximate sound reduction and absorbtion values for varying build-ups (for guidance only).

Glass Fibre insulation cavity depth (mm)	Weighted SRI Rw (dB)	Rockwool Insulation cavity depth (mm)	Weighted SRI Rw (dB)
190	41.7	190	42.9
235	42.4	235	43.9
185	42.4	185	43.4
235	43.1	235	44.4
185	25.8 / (0.48)	185	26.7 / (0.63)
235	26.2 / (0.68)	235	27.4 / (0.83)
210	42.7	210	44.0
260	44.2	260	45.7
310	44.9	310	46.7
190	41.7	190	42.9
265	43.1	265	44.7
315	43.8	315	45.7
180	41.5	180	42.6
230	42.4	230	43.8
280	43.3	280	45.1
210	26 / (0.57)	210	27.1 / (0.74)
260	26.5 / (0.72)	260	27.8 / (0.84)
310	26.9 / (0.56)	310	28.5 / (0.69)
215	26.1 / (0.59)	215	27.1 / (0.76)
265	26.5 / (0.71)	265	27.8 / (0.82)
315	27.0 / (0.55)	315	28.5 / (0.68)
185	25.8 / (0.48)	185	26.7 / (0.63)
235	26.2 / (0.68)	235	27.4 / (0.83)

Notes:

- Top sheet is assumed to be 0.9mm aluminium.
- Liner sheet is assumed to be 0.7mm steel.
- Structural deck assumed to be 153mm deep & 0.75mm thick steel.
- Purlins assumed to be at 1500mm centres.
- Perforated sheet allows for 30% holes and is typical of liner only (percentage for decks will vary)
- Density of glassfibre insulation = 12kg/m^3.
- Density of Rockwool insulation = 27kg/m^3.
- Figures in brackets are the absorption coefficients at 630Hz.
- Insulation cavity depth is the compressed depth of insulation
- All figures are approximate
- Laboratory results available on request for several standard constructions

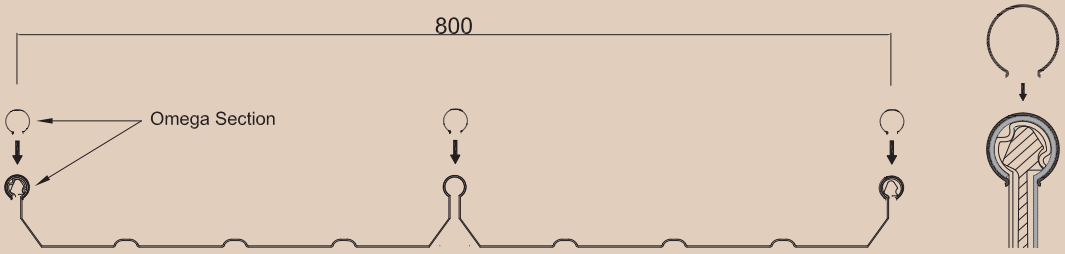
The following laboratory test data is available for several systems:

- Sound reduction
- Sound absorbtion
- Raindrumming

Rooflights

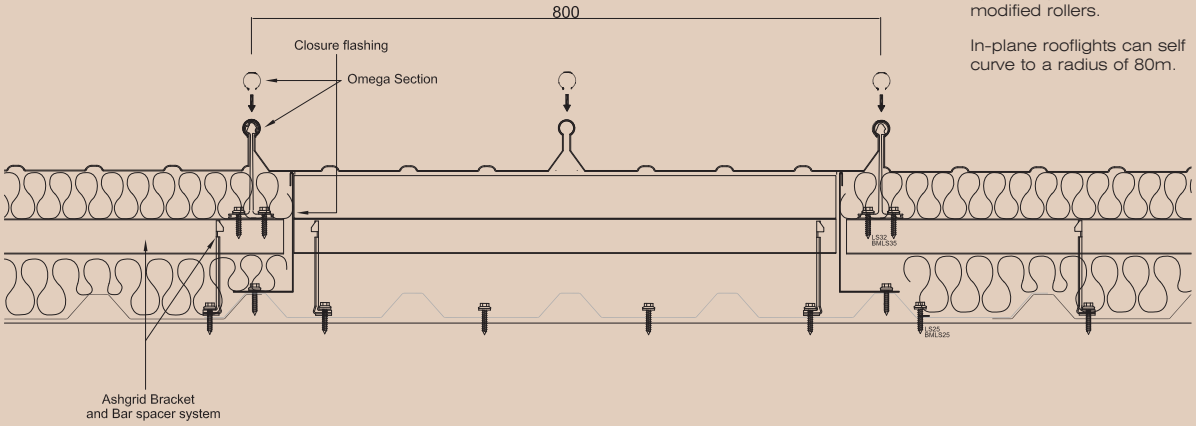
Zip up rooflights

In-plane zip up rooflights are available to suit the Ashzip system. Available 400 and 800mm wide, they offer both the aesthetics and practicalities of a GRP rooflight. We recommend that these are used full slope length, from ridge to eaves to prevent the need for joints, which are a potential weak point and are contrary to the principles of standing seam roofs. The seams are clamped in place by an Ashzip Omega Section and zipped with an oversize set of rolls.



Omega section positioned over seams and then zipped up with zipping machine using modified rollers.

In-plane rooflights can self curve to a radius of 80m.



Barrel vault rooflights project above the plane of the Ashzip, and are not integrated within the plane of the roof. Best practice design codes stipulate that the upstand should be 150mm from the pan of the Ashzip profile. The roof lights are supported by a 3mm galvanised steel two piece kerb at the edge of the rooflight. The kerb is in two pieces to allow a halter to be fixed over its base, to support the Ashzip sheet which abutts the rooflight upstand. Full cad details available upon request.

Barrel vault rooflights

Generally barrel vault roof light can be used within the following applications:-

1. Running parallel to the seams, down slope.
   A welded detail would need to be incorporated to allow drainage behind and around the rooflight.
2. Transverse across the roof. Consideration should be given to draining water around rooflights, particularity if there is a long run.
3. Along the ridge line
4. Curved roof. The tightest radius where barrel rooflights can be incorporated is generally 25m.
   In certain applications this can be tighter but would need to be considered on a project specific basis.

Ashzip curved profiles

Ashzip can be supplied both pre-curved and naturally flexed over the curvature of a structure on site.

This will depend upon the radius to be achieved with steel and aluminium being able to naturally curve to differing limits.

Whether the Ashzip is straight or curved, irrespective of radius, the halter spacing remains the same.

These are set out in the table below.

The curving capacities/radii of Ashzip are shown in the following table

Material	Naturally site Curved, convex	Pre-curved Convex	Pre-curved Concave	Wave form (Site-curved)		Wave form (Pre-curved)	
Aluminium	40m (*)	5.0m - Painted 4.2m - Stucco	12m - Painted 11.5m - Stucco	Convex 40m	Concave 60m	Convex 10m	Concave 20m
Painted Steels	60m (*)	12m	25m	By trial only	By trial only	25m	25m

(*) – Ash & Lacy recommend that all sheet lengths of less than 10m should be pre-curved. This is because shorter sheet lengths are much stiffer and do not flex as well when curved/flexed naturally on site. If metallic paints are to be used then please consult the Ash & Lacy Technical Department, as bend radii may vary. Tighter concave radii can be achieved on pre-curved waveform roofs depending upon application. Refer to technical for further advice. Waveform curves are based on 1 concave and 1 convex radius. Multi curves are achievable but may require trials on application.

Note: The above Radii for naturally curved sheets are to the top of steelwork. Under no circumstances should aluminium sheets be fitted to a radius of less than 40m without being pre-curved.

Ash & Lacy recommend that sheets are zipped up twice as work proceeds along the roof. In all cases the sheets must be zipped up directly one after another, with both passes of the machine. Sheets should not be zipped once and then zipped a second time after the roof has been layed. This will promote unnecessary foot traffic and lead to deformation of the pan of the sheet.

Any area where the sheets need to be walked on should be supported by high density non flammable insulation boards (or suitable alternative) and shown on all roof layouts as a designated walkway area (a non-combustible insulation must always be specified).

Foot traffic on sheets should be kept to a minimum and wherever possible not walked on at all. The sheets can be zipped by placing an operative at the ridge and eaves and setting the machine to automatic therefore removing the need to walk on the sheets.

When setting out halters on curved roofs the cover width does not need to be increased.

Ashzip components

Ashzip Full Height Halter Brackets

Ash & Lacy offer a full height halter system as standard. Developed exclusively for use with the Ashzip standing seam roofing system, the use of this thermally efficient halter provides a quick and easy installation solution where low U-values are required. The halter bracket is manufactured in heights of 245mm, 295mm and 345mm to offer U-values of 0.25 W/m^{2}K,0.20 W/m^{2}K and 0.16 W/m^{2}K respectively. U-values down to 0.10 W/m^{2}K can be easily achieved.

The Ashzip full height halter is the preferred method of construction for pitched and curved roofs, with the Ashgrid spacer support system used mainly in tapered applications. The 245mm height halter bracket requires 2 no. fixings diagonally in the corners of the base, whilst bracket heights of 295mm and 345mm require 4 no. fixings. There are arrows at the base of the halter indicating the direction of lay.

Ashzip Solid Halter Brackets

Solid halters are available in three standard heights 85mm, 120mm and 205mm. The height selected will depend on thermal performance requirements and the preferred method of construction. The notched side of the halter bracket head always faces the direction of lay – on the illustration shown this would be left to right. If halter brackets are fixed with the notched side of the halter facing in the wrong direction the sheets will not zip-up properly and the seams will run out of line. Under these circumstances the Ashzip sheets will not be adequately secured against wind uplift. Other sizes are available subject to size and quantity.

For all applications, halters are set out at 400mm centres (300mm for 300mm cover width sheets) whether or not the roof is straight or curved.

Ashgrid AG40 Bar

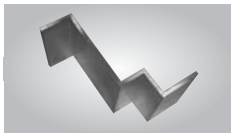
Manufactured from 1.25mm thick high yield galvanized steel and supplied in lengths of 1m, 2m & 3m incorporating the Safe-loc™ spigot ends, for easy on-site connection. See Ashgrid installation guide for further information.

Ashgrid Brackets

Brackets are supplied in various heights to suit the depth of construction. Brackets are manufactured from 1.6mm thick galvanized steel to BS EN 10142 and are supplied with a 3mm thick EPDM thermal insulator pad to the base.

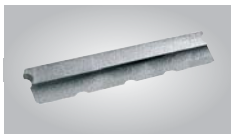
For fixing brackets into thin gauge steel use Ashfix BMLS25 fixings. To ensure maximum sheet to bar fastener performance use Ashfix BMLS25 with S16 washers for walls, S19 washers for roofs and S29 washers for rooflights. See Ashfix installation guide for further information.

Ashzip components



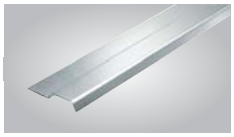
Single Skin Verge Clip

In constructions where an 85mm Ashzip Halter is to be used (generally single skin applications), a special 85mm verge clip must be used. Instead of fixing to the side of the Ashzip halter bracket the verge clip is fixed to the supporting structure. (All other standard components remain the same).



Ridge Shroud

The ridge shroud is used to cover the filler block. It provides an aluminium finish and prevents pests attacking the filler block. It is held in place by the ridge retainer. This component can be produced in various colours to match the roof sheet when required.

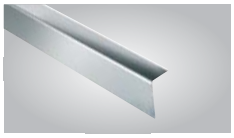


Ridge Retainer

The ridge retainer is used to hold the ridge closure flashing/shroud in place. It is fixed at every seam position along the roof.

Ridge Filler Block

The filler block is used to close off the cavity that is formed under the ridge flashing. It is protected by the shroud/ridge closure as stated above. (Please refer to standard details regarding insulation requirements at the ridge).



Drip Angle

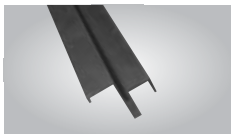
The drip angle is riveted to the underside of the pan of the profile with 2no rivets per pan. The drip angle is used to restrain the pan of the profile and to prevent damage due to foot traffic. It also provides additional resistance to wind uplift.

Eaves Filler Block

The eaves filler is used to close off the cavity formed by the seam of the profile. It is positioned before the sheets are zipped up and held in location by the drip angle.

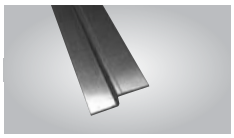
Liner Profile Filler

Trapezoidal liner profile filler blocks are also available from Ash & Lacy Building Systems. These should be used in conjunction with internal closure flashings. Refer to ridge and eaves details at the end of this guide.



One Piece Verge Extrusion

An extruded section, which is placed over the seam of the profile at gable ends. It is held in place by the Verge Clip, and secures the profile against wind uplift, as well as providing support for the eaves flashing.

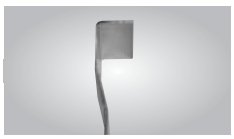


Ridge Support Zed

An extruded zed section which support the Ridge Flashing.

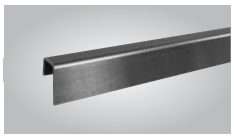
Verge Clip to suit One Peice Verge Extrusion

Fixed over the Verge Extrusion and secured by one fixing per clip into the halter at each halter location. Different sizes are available depending on the height of the halter.



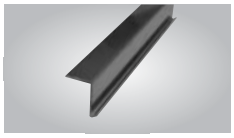
Verge Clip

Fixed over the Verge Channel and secured by one fixing per clip into the halter at each halter location. Different sizes are available depending on the height of the halter.



Verge Channel

Used to clamp the first leading edge seam into position held in place by the verge clip.



Verge Tolerance Clip

Hooks under the long leg of the verge channel and provides a bearing face to the verge flashing.

Ashzip components

Ashzip Zipping Machine

Powered Zipping Tool to close the Standing Seam over the adjacent sheet and the halter.

Ashzip Seam Crimper

The Ashzip Manual Seam Crimper is used to close the seam at the start of each run.

Ashzip Turn-up Tool

To introduce a turn-up at ridge conditions.

Ashzip Turn-down Tool

To introduce a turn-down in the pan of the sheet at eaves and valley conditions

Ashzip Halter Spacer

The halter spacers used to ensure that halters are correctly positioned.

Tie Bar

The Tie Bar is required in gable conditions to stabilise full height halters.

Span tables

Loadspan Tables For Ashzip 400 Systems Using Full Height Halters

0.9mm Aluminium (self weight 3.50 kg/m^2)

SPAN (m)		1.00	1.25	1.50	1.80	2.00	2.50	3.00
245mm	DOWNLOAD	6.00	5.50	5.00	4.18	3.63	2.79	1.95
Halter	WIND UPLIFT	5.60	3.73	1.85	1.39	1.09	0.90	0.71
295mm	DOWNLOAD	7.93	6.64	5.34	4.36	3.71	3.03	2.35
Halter	WIND UPLIFT	5.50	4.02	2.54	1.94	1.54	1.33	1.11
345mm	DOWNLOAD	9.86	7.77	5.67	4.54	3.78	3.26	2.74
Halter	WIND UPLIFT	5.00	3.72	2.43	1.88	1.52	1.37	1.21

0.7mm Steel (self weight 7.75 kg/m^2)

SPAN (m)		1.00	1.25	1.50	1.80	2.00	2.50	3.00
245mm	DOWNLOAD	5.04	4.87	4.69	3.94	3.44	2.81	2.18
Halter	WIND UPLIFT	6.00	4.35	2.70	2.26	1.96	1.44	0.91
295mm	DOWNLOAD	6.03	5.66	5.29	4.43	3.85	3.23	2.61
Halter	WIND UPLIFT	5.38	4.51	3.64	3.05	2.66	1.95	1.23
345mm	DOWNLOAD	7.01	6.45	5.88	4.91	4.26	3.65	3.03
Halter	WIND UPLIFT	4.76	4.09	3.42	2.87	2.51	1.84	1.16

All loads are characteristic working loads in kN/m^2 based on 4 or more spans.

In deriving the above figures the following criteria was applied:-

Strength

Safety factor for vertical loading 1.6.
Safety factor for wind uplift loading 1.4.
Safety factor for detachment of sheeting from halters under wind uplift loading 2.0.

Standard Verge Detail

The download figures are based on a deflection limit of span/200
The wind uplift figures are based on a deflection limit of span/180 (aluminium).
The wind uplift figures are based on a deflection limit of span/120 (steel).

Note:
The wind uplift tables are applicable for a fully enclosed roof with the perimeters installed. Ash & Lacy do not accept responsibility for out of the ordinary weather events which may damage the roof during construction. For Ashgrid and shallow extruded halter please contact the Ash & Lacy technical team.

Load bearing capacity and foot traffic

Ashzip standing seam roofing sheets have good resistance to damage, where possible the risk of deformation due to foot traffic should be avoided. Once zipped-up, sheets may be walked on occasionally without the need for additional load-spreading measures, but wherever possible foot traffic should be on or as close to the vertical seam as possible. The Ashzip sheets should not be used as a working platform.

If there is a requirement for a roof to receive considerable foot traffic, the risk of damage to the Ashzip sheets can be reduced by having designated walkway areas with high density Rockwool Hardrock insulation (or similar approved) to cope with foot traffic loads.

If there is going to be a requirement for providing support to the pan of the sheet, frequent access onto the roof, a walkable load bearing gutter should be considered at the design stage.

Where brickwork is being constructed above the roofing sheets, a protective covering must be used to prevent any mortar spillage from damaging the sheets and causing any unsightly staining or corrosion.

If the inclusion of a high density Rockwool Hardrock insulation (or similar approved) support is not possible, then the use of spreader planks is recommended along the seams with lattice planks perpendicular to the seam underneath. Consideration however should be given to maintenance access and any damage that may occur at a later date.

Coatings

Where foot traffic occurs on the roof it should be expected that marking of decorative finishes will occur. Any paint finish is decorative only when used with aluminium and the substrate will not be affected by scratches. Ash & Lacy's Technical Department can advise on suitable products to repair any such damage.

Ashgrid Load Brackets

When using the Ashgrid bar & bracket system, 'load brackets' must be used when loading out with packs of sheets or insulation. This component is only required in loading out locations.

Note: For Ashzip to resist the required wind uplift the roof must be fully encapsulated with perimeter fabrications. The roof will resit moderate gusts of wind during installation but strong winds must be catered for by the roofing contractor. The roofing contractor and the installer have the overall responsibility to ensure the roof is secured during installation, and should regularly check the local weather forecast and the met office website to cater for upcoming wind events.

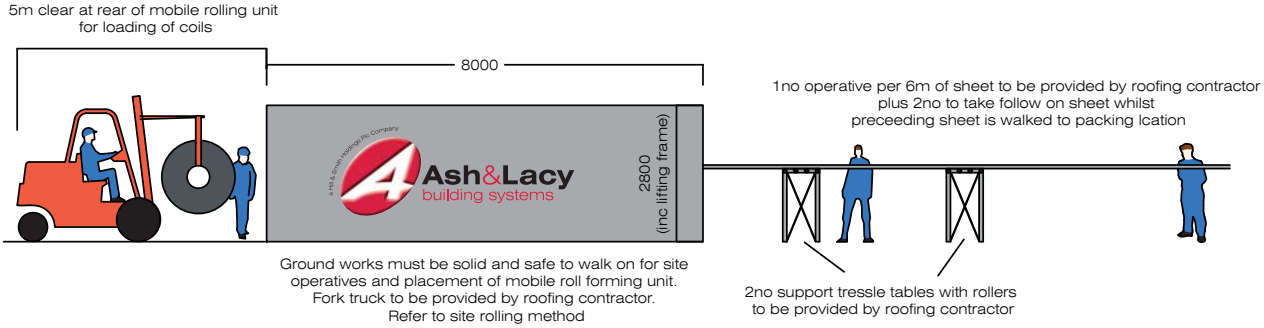
Site rolling

Production of Ashzip on site is very easy and can be carried out on large or small projects, subject to space. In most cases the Mobile roll forming unit is lifted and suspended at eaves level which allows fast production of continuous length sheets.

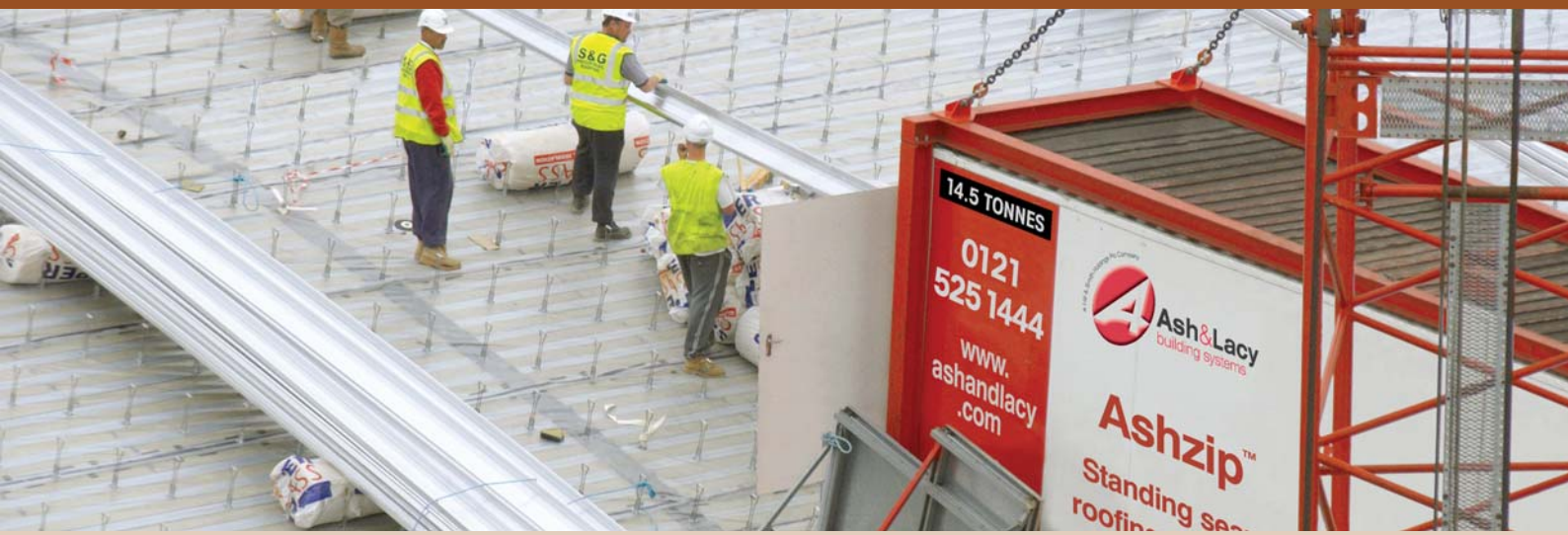
This is both beneficial for the roofing contractor and the building owner because it means that the programme can be reduced and potentially save on cranage and scaffold costs through speed of production.

Benefits

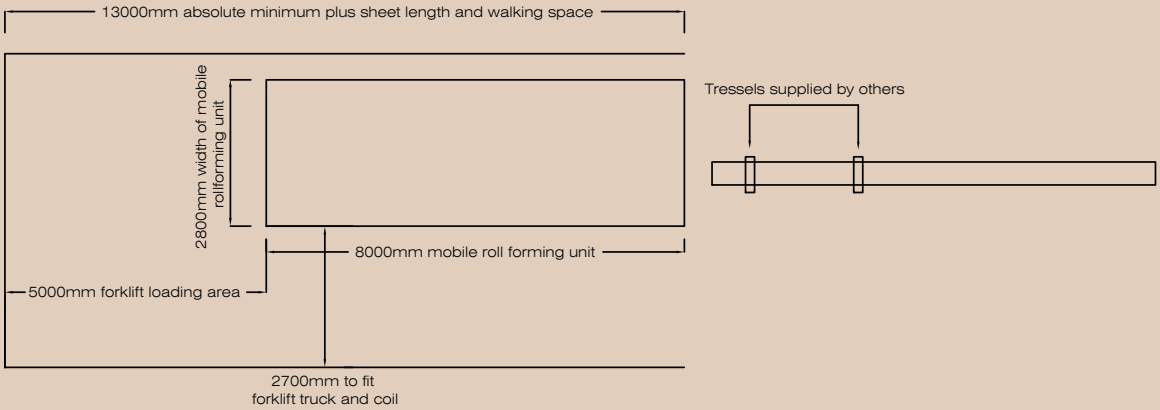
- Continuous lengths – without joints and end laps
- No Through Fixings
- Safe speedy production on site, minimal handling
- Available in Steel or Aluminium, other materials such as Zinc or Copper also available
- Can be rolled at ground level or eaves level
- No structural scaffolds or ramps required
- Reduced road transportation needed - less 'component miles'
- Full Technical backup and advice
- Proven product, supported by library of details and case studies



Site rolling



Production at ground level on-site



Minimum area required for producing Ashzip sheets aat ground level

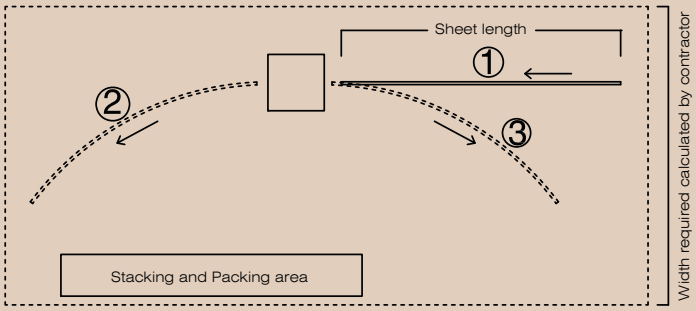
Note: Contractor is to provide tressels 1.4m high to support the rolled Ashzip profile at maximum 1500mm centres

Curving

Site curving of Ashzip sheets must be carried out at ground level. The area required is:

Sheet length x 2 + 10m.

Care should also be taken to provide sufficient space for the curved sheets



1. Straight sheets fed into curver
2. Curved sheet comes out other side. The number of passes through the curved will depend upon radius
3. Curver swings around further by each subsequent pass through the machine

Note:
Sheets with straight ends will swing around further. Adequate packing and stacking space will need to be provided.

Support

When producing Ashzip sheets at eaves level, a suitable crane will be required to lift and support the containerised roll-forming equipment for the duration of the production process. The container weighs **14.5 tonnes**, and is lifted by attaching chains to the four top corners. Please consult Ash & Lacy's Technical Department for specific details and instructions

Sustainability

Sustainability

Over the past few years 'sustainability' has evolved into a key driver in the specification process with many innovations being developed in response to environmentally-driven legislation. Ash & Lacy Building Systems are one such company which has adhered closely to these environmental requirements; in addition the Ashzip standing seam roofing system can play a vital role in achieving true sustainability in the roofing market.

The strength of steel and the lightness of aluminium mean that fewer raw materials are needed in the manufacturing process, reducing energy costs and resulting in more efficient transportation. The superb in-built strength to weight ratio of steel and aluminium make them ideal for giving a new lease of life to older buildings. Ash & Lacy cladding and roofing systems can bring most buildings up to modern thermal insulation standards as well as prolonging the life of the building through a renewed appearance.

End-of-life benefits

When a building's envelope is made of steel or aluminium, the end of its life doesn't mean the end of its usefulness. The original framework can be retained for re-cladding, whilst the old cladding materials are easily recovered for re-use and recycling.

The recycling initiative

As well as following socially responsible principles, there are also economic incentives in place for recycling steel and aluminium. What's more, aluminium can be reused and recycled many times over without deterioration of the product, giving them a life enduring well into the future.

Product initiatives

Ashzip Enviro-Roof A green roof is one which has a covering of vegetation, soil or a growing medium such as Sedum over a waterproof layer (Ashzip). Through our partnership with leading Green Roof supplier, BBS, Ash & Lacy are able to provide a high quality, sustainable roofing solution that is substantially lighter than other Green roof options available in the marketplace.

Rainwater harvesting

Ash and Lacy's extensive range of guttering and rainwater goods, together with a high level of technical knowledge means that combined with market leading supply chain partners we are able to incorporate rainwater harvesting techniques that can recycle grey or brown water loss.

Solar and Photovoltaics

Renewable energy technologies such as solar panels will have an increasing part to play in the construction industry. The flexibility of Ash and Lacy's roofing systems means they are ideal for incorporating solar solutions and it is an area that our technical department is well equipped to advise on having been associated with previous project.

Green Guide to specification

Based on BRE Green Guide to specification, the Ashzip, insulated roof build up would be rated as follows

A Least environmental impact	
B reduced environmental impact	
C Poor environmental impact	
Recyclability	A
Recycled input	A
Climate Change	A
Fossil Fuel depletion	A
Ozone Depletion	A
Human Toxicity to Air & Water	A
Waste disposal	A
Acid Deposition	A
Ecotoxicity	A
Eutrophication	A
Minerals Extraction	A
Overall summary rating	**A**

Breeam Points

As well as its obvious push towards sustainability, Ash & Lacy's own aluminium product range gains 5 BREEAM credits with no ozone depleting substances used, no asbestos, 80% of all roof area specifications receiving an 'A' rating and both the original structure and all aggregates, landscaping, masonry and the Ash & Lacy Enviro-roof being almost completely recyclable.

Ashure

Ashure Warranty Scheme - The Total Envelope System Warranty

The Ashure Warranty Scheme is a free total envelope warranty service provided by Ash & Lacy Building Systems Limited. It covers all products supplied by Ash & Lacy and its Supply Chain Partners. It also covers work carried out by Ash & Lacy's trained Supply Chain Partners. It also covers work carried out by Ash & Lacy's trained sub-contractor partners.

Ash & Lacy will administer the warranties provided by its Supply Chain Partners, in respect of their products and co-ordinate all warranty related issues.

Ash & Lacy does not provide warranties on behalf of its Supply Chain Partners and accepts no liability whatsoever in respect of the warranties provided by those Supply Chain Partners.

Ash & Lacy Products

- Ashzip Standing seam - Aluminium, Steel, Copper, Zinc, Stainless Steel
- Ashtech rainscreen cladding - ACM, Aluminium, Copper composite.
- Ashjack over roof system
- Ashfab fabrications, rainwater systems, louvers, specialist fabrications
- Ashfix engineered fastener solutions
- Ashgrid bracket & bar system

Supply Chain Partners

- Photovoltaic systems
- Rainwater harvesting & recycling
- Siphonic rainwater systems
- Rooflights in both GRP & Polycarbonate
- Brise Soleil
- Curtain walling / glazing / entrance doors / window systems
- Walkway systems & Access hatches
- Fall arrest systems
- Solatubes
- Structural decking & tray systems including perforated systems
- Single ply membranes & membrane coated composites
- Aluminium site welding
- Vapour Control and Breather membranes
- Insulation products
- Sealants
- Trapezoidal & Sinusoidal profiles in Steel & Aluminium

need logo

Alliance Warranty Management

AWM Pioneer Warranty

For added insurance against Latent Defects, the AWM Pioneer Warranty is available, at additional cost to the Client. The AWM Pioneer Warranty provides 10 years insurance against Latent Defect arising from defective workmanship, defective materials, damage resulting from defects in the design & non-compliance with Building Regulations.

AWM Protector Warranty

The AWM Protector Warranty ensures the quality control of workmanship and materials throughout any project, through weekly inspections of the roofing & cladding installation.

8 Key benefits -

- Independent drawing/design review
- Weekly site inspections to audit workmanship
- Airtightness audit
- Perimeter detailing check
- Full reporting system
- Compliance with current Building Regulations
- Compliance with good working practice
- Independent warranty - up to 25 years

All advice and site audits are covered by £5,000,000 Professional Indemnity Insurance

For full details of the AWM Warranties, please contact Ash & Lacy Building Systems Ltd

ashandlacy.com

Fabrications and Flashings

Fasteners and Accessories

Over-Roof Conversion Systems

Rainscreen Cladding Systems

Standing Seam Roofing Systems

Spacer Support Systems

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Bromford Lane,
West Bromwich,
West Midlands B70 7JJ
Tel: **0121 525 1444**
Fax: **0121 525 3444**

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South Street, Whiteinch,
Glasgow G14 0SY
Tel: **0141 950 6040**
Fax: **0141 950 6080**

Leeds
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Fax: **01924 465 214**

a Hill & Smith Holdings Plc Company

Ash&Lacy building systems

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