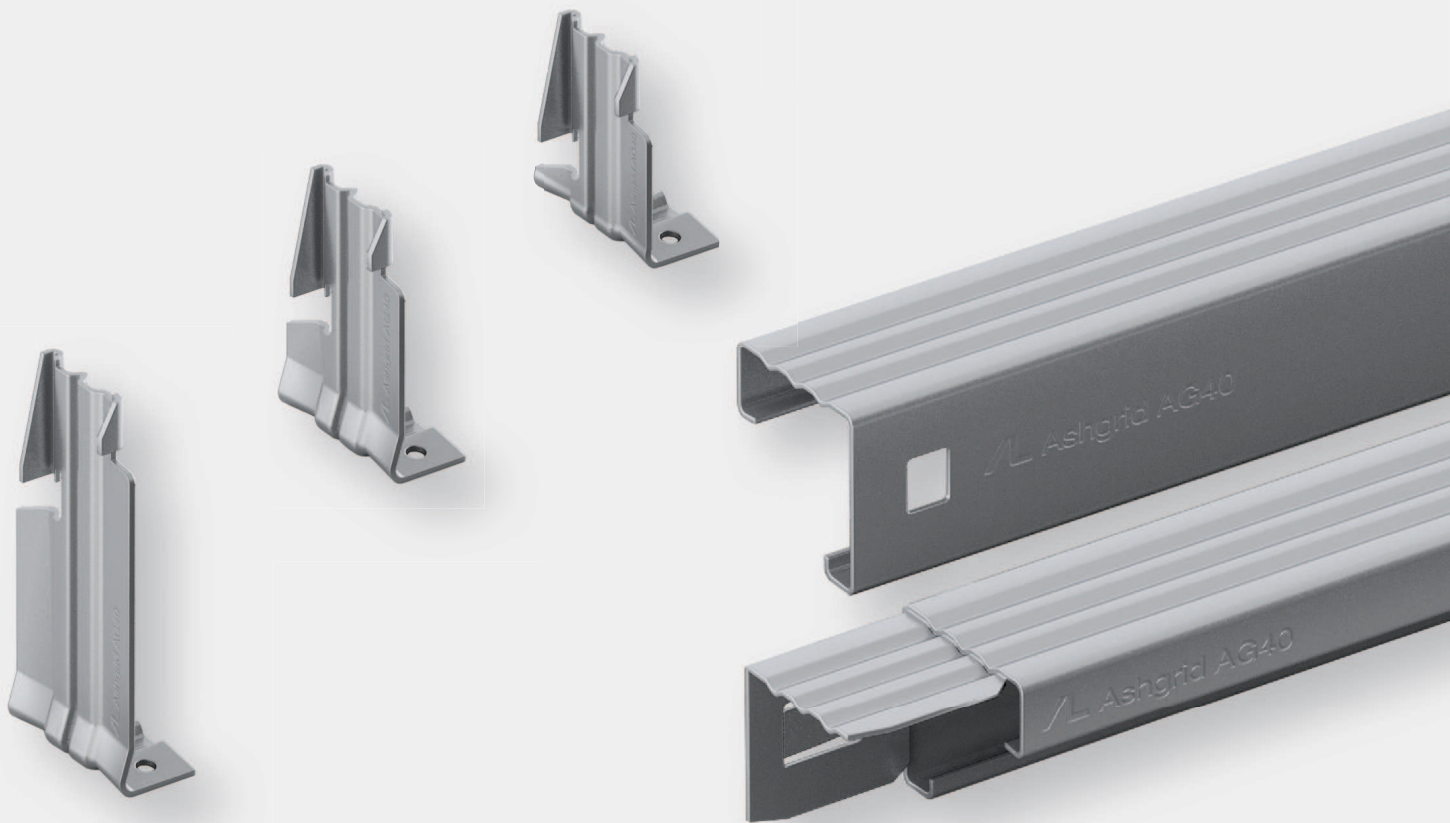


ASHGRID

SAFE-LOC™
SECURE BY DESIGN



Spacer Support System



Manufactured by
Ash & Lacy Buildings Systems Ltd UK

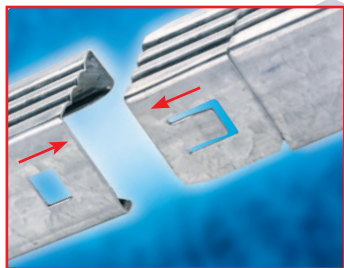
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SAFE-LOC™
SECURE BY DESIGN



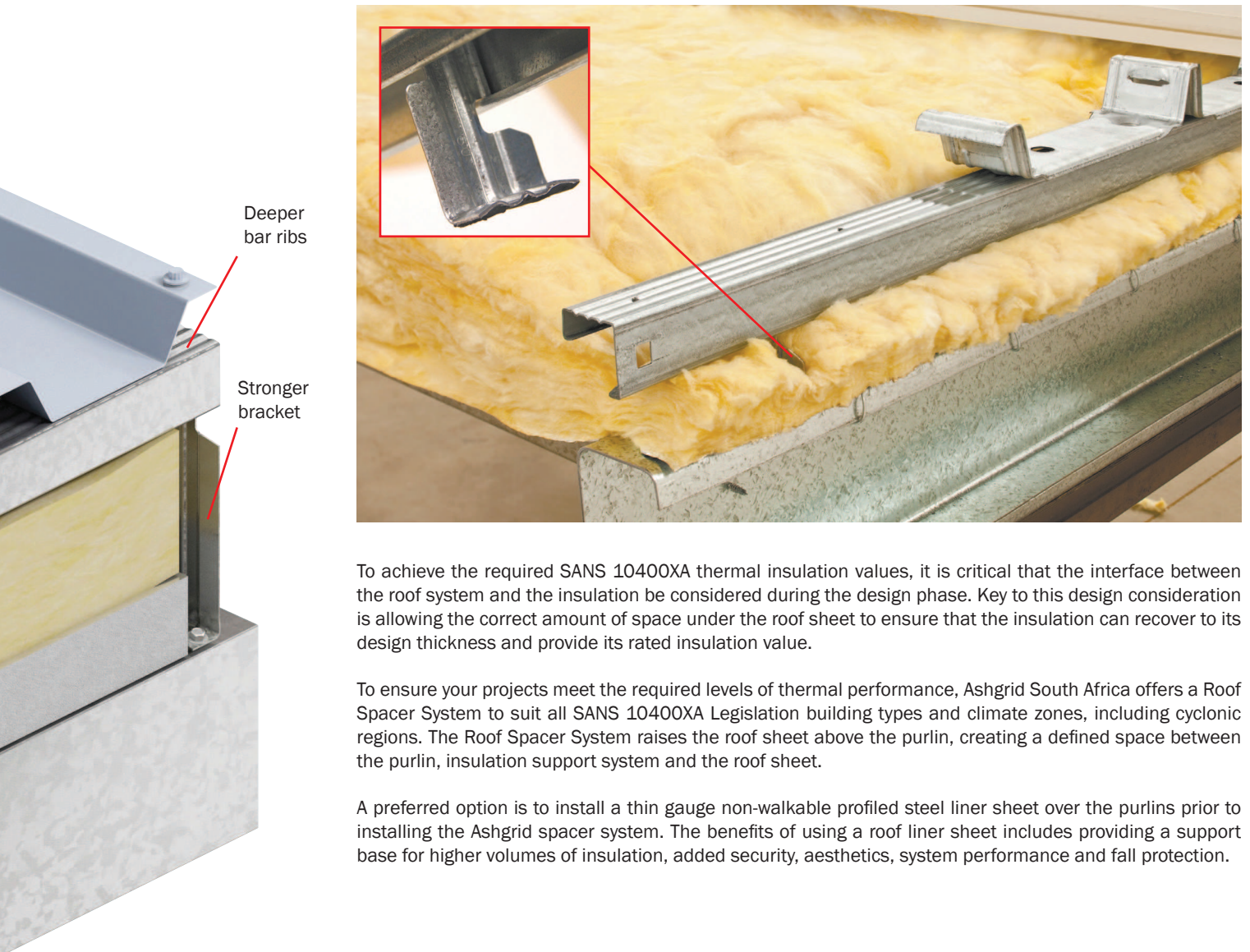
No sway
brackets

SANS 10400XA

Energy Efficiency Legislation

The much anticipated Energy Efficiency Legislation was gazetted on the 9 September 2011

The new legislation requires greater depths of insulation to be installed in the roof cavity making the previously used construction methods mostly redundant and unsafe.



To achieve the required SANS 10400XA thermal insulation values, it is critical that the interface between the roof system and the insulation be considered during the design phase. Key to this design consideration is allowing the correct amount of space under the roof sheet to ensure that the insulation can recover to its design thickness and provide its rated insulation value.

To ensure your projects meet the required levels of thermal performance, Ashgrid South Africa offers a Roof Spacer System to suit all SANS 10400XA Legislation building types and climate zones, including cyclonic regions. The Roof Spacer System raises the roof sheet above the purlin, creating a defined space between the purlin, insulation support system and the roof sheet.

A preferred option is to install a thin gauge non-walkable profiled steel liner sheet over the purlins prior to installing the Ashgrid spacer system. The benefits of using a roof liner sheet includes providing a support base for higher volumes of insulation, added security, aesthetics, system performance and fall protection.

Introduction

As part of our programme of continuous innovation, Ash & Lacy introduce the high performance Ashgrid bar and brackets incorporating the unique Safe-Loc™ feature (patented). Designed to meet the everincreasing demands from Building Regulations whilst at the same time making installation more efficient and safer for contractors on site.

All spacer support systems are at risk during the installation stage when they are not restrained by the sheeting and are subjected to forces from foot traffic, temporary loading and high winds.

Accurate, close fitting and reliable bar connections are also required to ensure the stability of any spacer support system during construction with some systems even having to rely upon screw fixings to prevent their bars from separating**.

The Ashgrid Safe-Loc™ spacer support system addresses these issues through a combination of innovative design features which improve system stability, safety and ease of construction, reducing installation time and costs when compared with other spacer support systems.

The enhanced AG40 spigot design with its innovative Safe-Loc™ feature (patented) provides stability and peace of mind at the click of a tab. This prevents the Ashgrid bars from separating during the installation process ensuring safe, precise gauging as well as quicker installation. The AG40 bar is widely acknowledged to be of superior quality and is produced to exact engineering tolerances. With the spigots pushed home in one quick and easy action, the Safe-Loc™ tab engages, providing the added security benefit of an automatic inter-lock between the bars every time. Once engaged the bar ends cannot be accidentally or unintentionally separated ensuring the system remains stable and secure during the critical installation stages. Nevertheless, the joints can be 'unlocked' if the need arises.

The enhanced bracket design with deep ribs further increases the performance of the Ashgrid system, removing the need for anti-sway brackets at construction depths below 250mm*. Ashgrid Safe-Loc™ provides more benefits to the installer with fewer components, faster installation times and reduced system costs.

The time proven 'twist-lock' feature of the Ashgrid brackets still remains as popular today as always. With its easy slide and twist action from the bar ends, or engage and twist to fit at any point along the bar. The fitting of the brackets is simplicity itself and the quickest in the marketplace, easy from first to last with a minimum of force required, reducing the risk of cut hands. The brackets are also just as easy to disengage and re-position if necessary.

An ongoing programme of research and development into the system, the first engineered spacer support system in the UK, has ensured Ashgrid has remained an optimum solution for a wide range of roofing applications.



- The Ashgrid system can accommodate any depth of insulation required by the current SANS 10400XA Energy Efficiency Legislation.
- Safe-Loc™ spigots – fast, secure and safe bar joints
- No need for bar end fixings – saving time and cost
- Raises the standards for spacer support systems
- Maximum spigot efficiency is always achieved and a consistent module maintained
- Allows continuous load transfer throughout the bar run
- High performance brackets with deeper ribs for improved structural performance
- Brackets include an EPDM base pad to eliminate thermal breaks
- No requirement for anti-sway brackets below 250mm* construction depth
- Quick, easy and safe insertion of brackets from the side or from the bar ends
- Brackets can be easily repositioned if required
- Deep ribbed bar, ensuring optimum fixing efficiency for the top sheet
- High fixing torque and increased pull-out strengths achieved
- Comprehensive and friendly technical backup with nationwide distribution
- Products manufactured to BS EN ISO 9001: 2000

** In line forces can be transmitted through the joint without the need for screw fasteners.

* For exceptional site loading conditions and for heights above 250mm advice on performance should be sought from the Ashgrid SA Technical Department.

With the advent of the SANS 10400XA Legislation of the Building Regulations and the requirement for deeper thermal cavities within built-up systems, it has become increasingly important that careful consideration be given to the safety and security of the installers and the spacer support system, in particular during the construction phases.

A roofing system is at its greatest risk during the installation stage when it is not restrained by the top sheeting and is subjected to loading from foot traffic, temporary loading and heavy sheet packs. This combined with drag forces from high winds tends to compound these problems further.

With construction depths increasingly exceeding 100mm and with the ongoing need to improve installation efficiency and system performance, Ashgrid AG40 has been further enhanced to satisfy these increasingly demanding requirements.

Construction depths up to and including 250mm

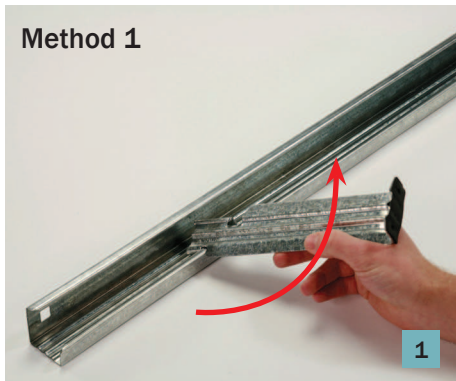
All spacer support systems will be exposed to in-line sway forces during their installation. To counter this, the stability of AG40 has been further enhanced through improvements in bracket design and the introduction of the Safe-Loc™ spigots. These designed-in features perform each and every time, providing peace of mind without reliance on extra, time consuming bar-end fixings and anti-sway brackets.

For cavity depths up to and including 250mm no additional sway control measures need to be employed on the Ashgrid AG40.

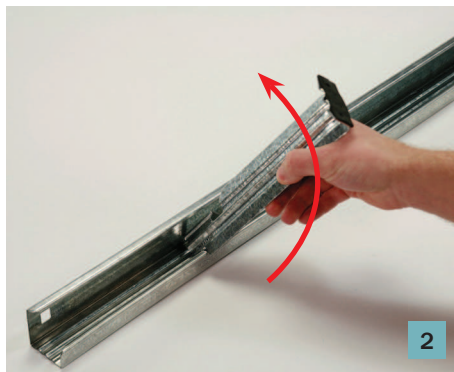
For exceptional site loading conditions and for heights above 250mm advice on performance should be sought from the Ash & Lacy Technical Department.

Choice of installation methods to suit personal preference and site conditions

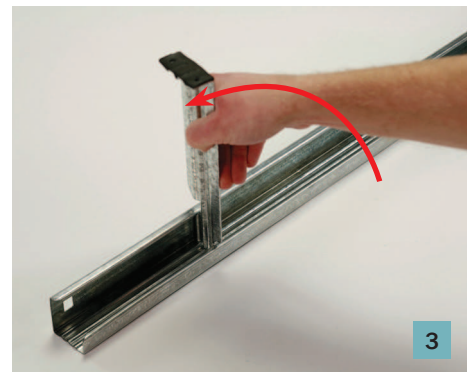
Method 1



1. Lay bar on roof deck and offer the small flange of the bracket to the small flange of the bar.

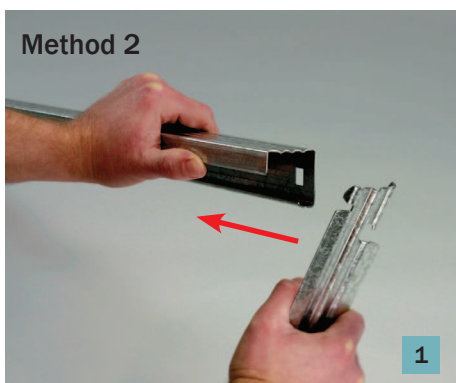


2. Tilt and rotate bracket backwards at desired fixing position.

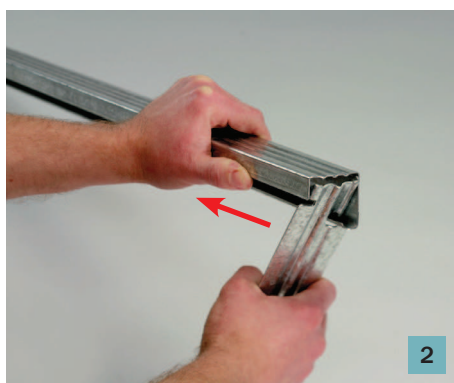


3. Twist bracket and snap into position at 90° to bar.

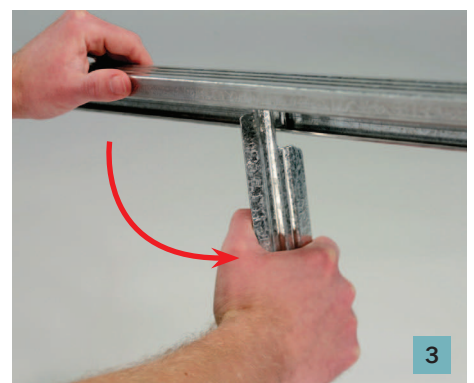
Method 2



1. Offer the bracket to the bar at an angle from the non-spigot end.



2. Slide brackets along the bar to the desired fixing positions.



3. Snap each bracket upright to lock into position at 90° to the bar.

Brackets may be repositioned by reversing this action and sliding along the bar as in steps 1 & 2.

4. Making certain there is a bracket within 100mm of a spigot end, install additional brackets to match the liner module up to 1m centres maximum. (Bracket centres may need to be reduced in areas of high wind suction or heavy snow loading).

5. Engage the open end of the bar onto the Safe-Loc™ spigot and push firmly until the tab clicks into position. To release, simply depress the tab with a sharp object such as a screwdriver.

6. Continue as above for quick, safe and secure installation.

Brackets should be fixed to the roof deck using two Ashfix LS25 fasteners inclined and ensuring that brackets do not twist in the bar.

Installation

Ashgrid is extremely versatile and is ideal for new builds or over-roofing projects. By creating a defined roof cavity above purlin the professional team is able to combine various insulation materials to achieve Energy Efficient roofs that deliver high levels of thermal and acoustic Performance.

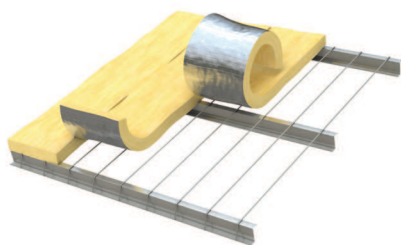


Fig 1: In the above configuration a basic straining wire is pulled taut over the purlins to provide support to the new insulation blanket. Insulation is installed from ridge to gutter.



Fig a: In the above configuration rigid insulation boards are installed over purlin. The rigid insulation boards need to be secured to the purlins by means of self drilling fixings with a 45mm diameter fender washers to alleviate movement in negative pressure environments. The Ashgrid Spacer System is installed by recessing the brackets through the rigid insulation boards and securing to the purlins. This creates a defined roof cavity to accommodate the insulation.



Fig i: The image above depicts either an existing roof or a new profiled steel liner sheet in a new-build scenario.

The Ashgrid brackets are secured to the main purlins by means of two screws through angled, pre-drilled holes in the base of the Ashgrid brackets.

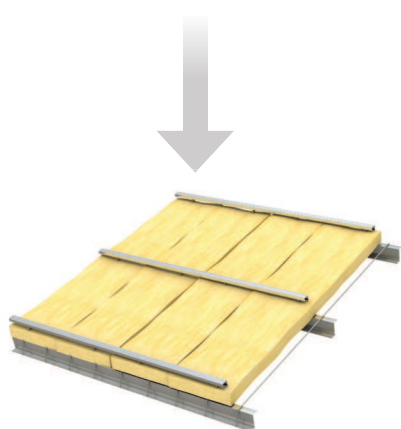


Fig 2: The Ashgrid Spacer System is installed to the purlins to create a defined roof cavity. The brackets are pressed through the insulation blanket allowing it to bulk back to the design depth. This prevents compression of the insulation whilst providing the necessary support to the roof covering. It is recommended to stagger the joints of the insulation when more than one layer is installed. It is imperative that a vapour barrier be installed in high condensation regions.



Fig b: Bulk insulation to the required depth can then be installed over the installed rigid boards. Care needs to be taken that the bulk insulation is packed tightly to avoid thermal bridging. It is recommended practice to stagger the joints of the insulation when more than one layer is installed. It is imperative that a vapour barrier be installed in high condensation regions.

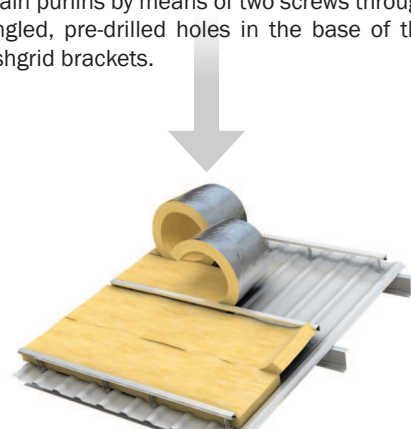


Fig ii: Bulk insulation to the required depth can then be installed over the liner sheet or existing roof. Care needs to be taken that the bulk insulation is packed tightly to avoid thermal bridging. It is recommended practice to stagger the joints of the insulation when more than one layer is installed. It is imperative that a vapour barrier be installed in high condensation regions.

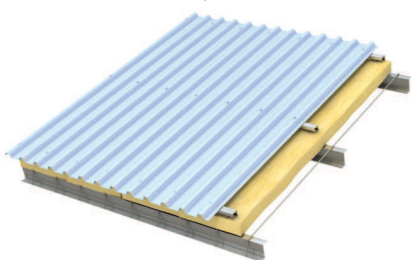


Fig 3: The new concealed or pierced fix longspan roof sheeting is then easily installed to the Ashgrid bars with the conventional recommended fasteners.

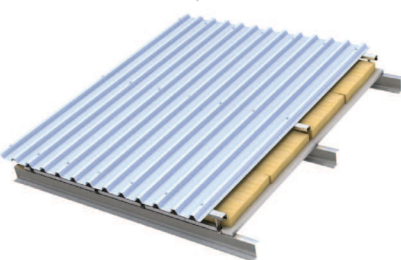


Fig c: The new concealed or pierced fix longspan roof sheeting is then easily installed to the Ashgrid bars with the conventional recommended fasteners.

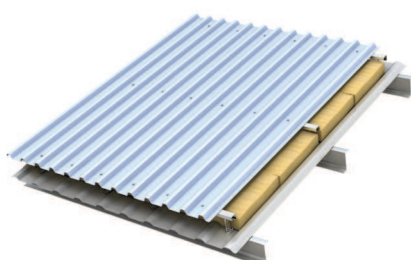
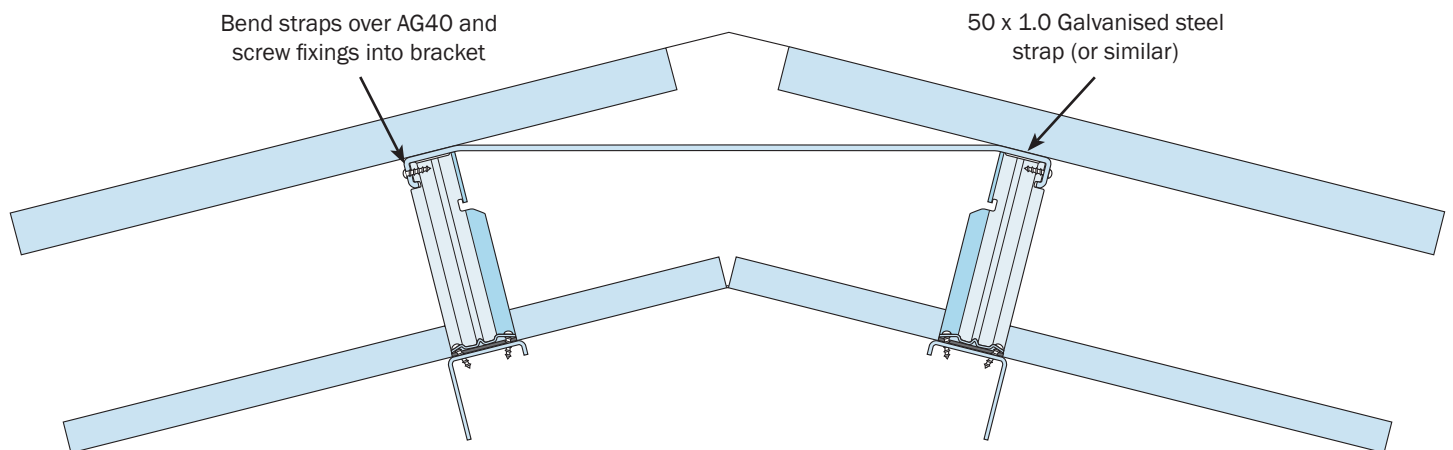


Fig iii: The new concealed or pierced fix longspan roof sheeting is then easily installed to the Ashgrid bars with the conventional recommended fasteners.

The above three configurations are merely examples of a host of configurations that are possible with the Ashgrid Spacer System. Please do not hesitate to contact our Technical team should you require further advise regarding specific projects.

Pitched roofs



With roof constructions ever increasing in depth there is a tendency for the support system to rotate down the slope by the action of the roof loading. To prevent this, the ridge brackets must be fully tied together as illustrated. Screw fixing the end and side laps of the roof sheet ensures continuity. This enables each roof slope to act as a stress plate hanging from the fixed ridge detail and reduces any downslope movement.

Note

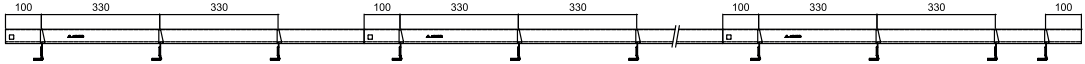
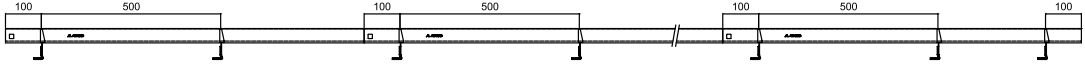
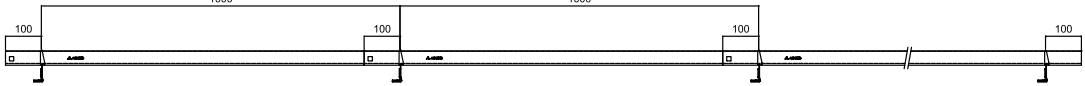
It is preferable that the Ashgrid brackets either side of the ridge are installed in line.

The steel strap should be bent over and around the AG40 bar and fixed to the small flange using two screw fixings.

To eliminate any out of balance forces it may be prudent to sheet both slopes in unison, gradually working up to the ridge detail.

Bracket configuration

The diagrams below indicate the required placement of the brackets in accordance with the Load Table under Design Data (2).

ASHGRID BRACKET CENTRE SPACING	BRACKET CONFIGURATION NOTE: A BRACKET MUST ALWAYS BE PLACED WITHIN 100mm OF EACH END OF THE TOTAL ASHGRID SECTION	BRACKETS PER METRE
0.33m		3
0.50m		2
1.00m		1

Note: Each row (ie each purlin run) of Ashgrid will require 1 additional bracket assembled on-site within 100mm of the end of each row.

These brackets are not included in the standard assembly and need to be ordered separately. Assembly tolerance ± 50mm.

Table 1: Ashgrid Bar & Bracket System Dead Weights (m)

SYSTEM HEIGHT	85mm	110mm	135mm
3 Bracket System	1.27kg	1.35kg	1.39kg
2 Bracket System	1.21kg	1.26kg	1.29kg
1 Bracket System	1.15kg	1.18kg	1.19kg

AG40 Load Span Tables – Multi Span Condition

Bar Spacing (m)	Direction of loading	Bracket Centres Along Bar (m)		
		0.33	0.5	1.0
Loading in kN/m ²				
0.3	Download	30.30	20.00	8.84
	Uplift	30.30	20.00	8.29
0.4	Download	22.73	15.00	6.63
	Uplift	22.73	15.00	6.22
0.5	Download	18.18	12.00	5.30
	Uplift	18.18	12.00	4.97
0.6	Download	15.15	10.00	4.42
	Uplift	15.15	10.00	4.14
0.7	Download	12.99	8.57	3.79
	Uplift	12.99	8.57	3.55
0.8	Download	11.36	7.50	3.32
	Uplift	11.36	7.50	3.11
0.9	Download	10.10	6.67	2.95
	Uplift	10.10	6.67	2.76
1.0	Download	9.09	6.00	2.65
	Uplift	9.09	6.00	2.49
1.1	Download	8.26	5.45	2.41
	Uplift	8.26	5.45	2.26
1.2	Download	7.58	5.00	2.21
	Uplift	7.58	5.00	2.07
1.3	Download	6.99	4.62	2.04
	Uplift	6.99	4.62	1.91
1.4	Download	6.49	4.29	1.89
	Uplift	6.49	4.29	1.78
1.5	Download	6.06	4.00	1.77
	Uplift	6.06	4.00	1.66
1.6	Download	5.68	3.75	1.66
	Uplift	5.68	3.75	1.55
1.7	Download	5.35	3.53	1.56
	Uplift	5.35	3.53	1.46
1.8	Download	5.05	3.33	1.47
	Uplift	5.05	3.33	1.38
2.0	Download	4.55	3.00	1.33
	Uplift	4.55	3.00	1.24
2.1	Download	4.33	2.86	1.26
	Uplift	4.33	2.86	1.18
2.2	Download	4.13	2.73	1.21
	Uplift	4.13	2.73	1.13

Notes

All loads are working loads. Steel based on Z39 material. Download deflection = span/200.

Figures limited to a bar/bracket connection load of 3kN. Figures limited by pull-out load of 3kN at bracket position using 2 No. fixings

Ultimate bending stress is based on a load factor of 1.5 for download and 1.6 for uplift.

The uplift figures must be compared to the pull-out capacity of the screw connections fixing the bracket to the structural purlin.

Loading out requirements



Provision for loading out

Ashgrid is strong enough to support all the design working loads relevant to the building cladding system in accordance with our recommendations. However, during the course of construction the spacer system may be subjected to abnormal and/or concentrated loadings from various sources such as, walkway boards, foot traffic, construction materials and heavy sheet packs, often up to two tonnes in weight. This is likely to be when the system is less stable, with relatively few brackets being fixed, and without the restraint that the fixed outer sheet provides.

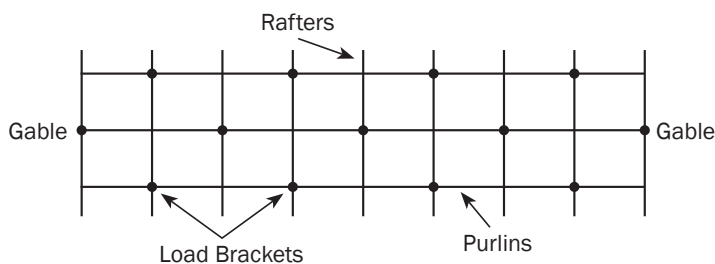
Lack of attention to the need for supporting abnormal loading could cause partial collapse. The engineered solution is to use an Ashgrid heavy duty load bracket as and when required. These brackets are made from 2mm thick galvanised steel and are of suitable height for the chosen system. They are fixed by two standard fasteners through the base and into the roof purlin and through the head of the bracket in to the side of the Ashgrid bar using two standard fasteners.

Forward planning may allow the positioning of the load bracket in lieu of a standard bracket position, thereby saving the cost of the Ashgrid bracket. Thus the load bracket will support a vertical load of 1 tonne. Heavy loads should be located on the roof over the line of the main rafter. (Mid span loads could adversely affect the roof purlins).

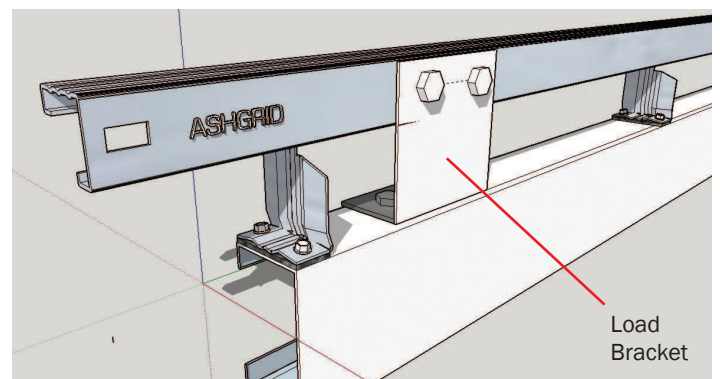
If the construction load positions are not known, then load brackets could be positioned over the rafter on alternate purlin lines in a staggered pattern and thus giving more freedom to loading out.

Other means of load support have been adopted, such as timber packers, and whilst these can be effective, they are obviously less engineered and should be used with caution, and at the contractors risk as they have been known to shift and lead to failure.

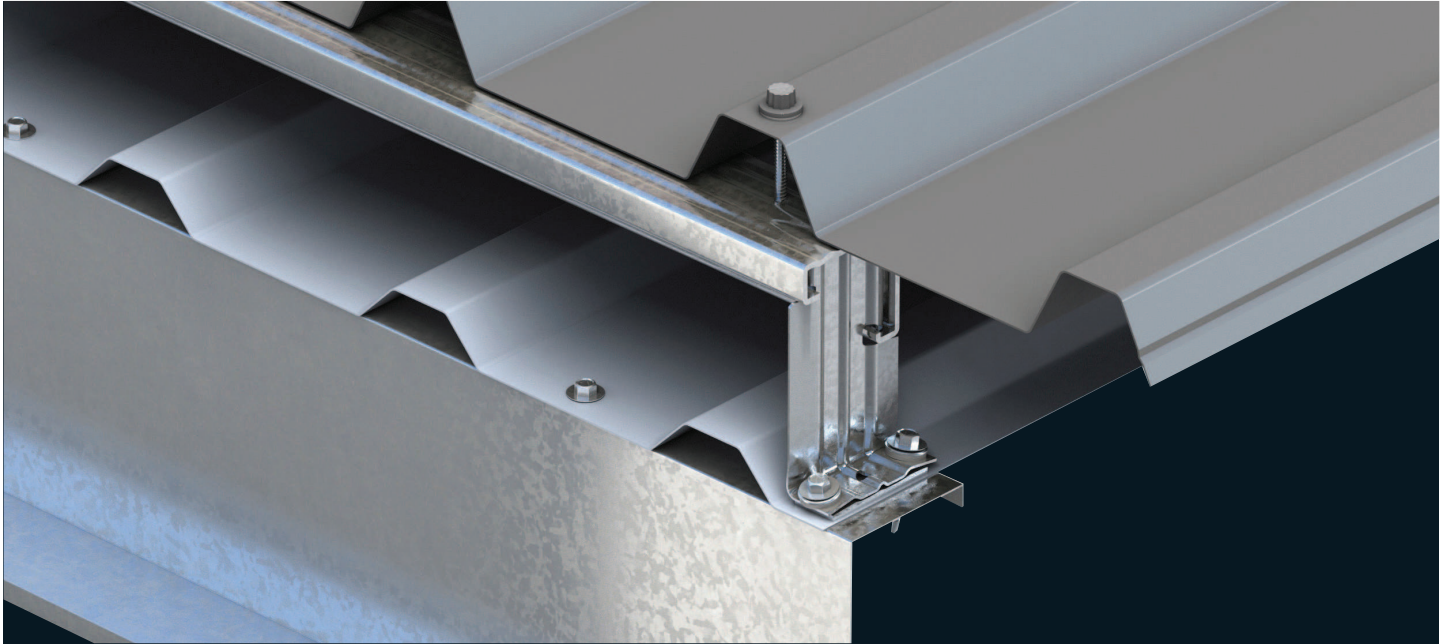
Load Bracket Arrangement



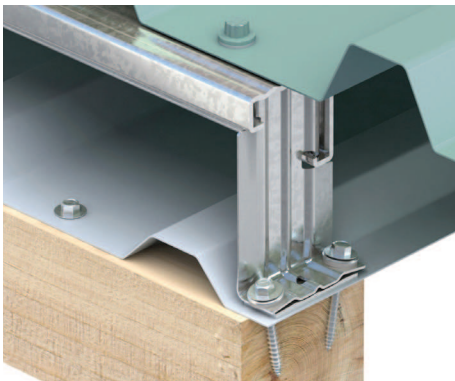
Typical Load Bracket Detail



Component specification



Material specification



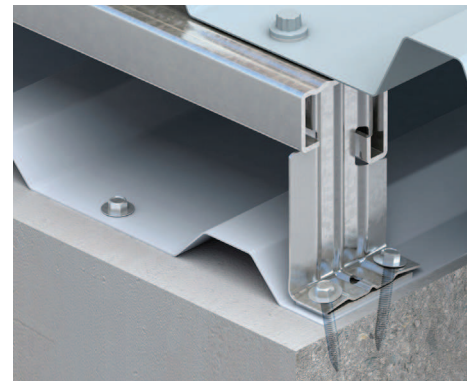
Ashgrid AG40 bar

Manufactured from 1.25mm thick high yield galvanised steel to S390GD + Z275 NA-C. Coil to EN 10147: 2000. Minimum yield: 390N/mm², Minimum tensile: 460N/mm². Supplied in lengths of 1m, 2m & 3m incorporating spigot end for easy on-site connection.



Ashgrid brackets

Manufactured from 1.6mm thick galvanised steel to FEPO2G + Z275 BS EN 10142. Supplied with a 3mm thick EPDM base thermal insulator pad the standard bracket heights (mm) are: 60, 80, 85, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250 & 280.



Ashfix fixings LS25

(1.25mm – 3mm thickness steel)

For fixing brackets into thin gauge steel use LS25 fixings. To ensure maximum sheet to bar fastener performance use LS25 with G16 washers for walls, G19 for roofs and G29 for rooflights.



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