

This section provides guidance on meeting the performance requirements for fully supported single skin metal roof coverings and self supporting double skin metal roof coverings. Both systems may be define as:

- Fully supported single skin metal roof coverings – This is where metal sheets (typical materials include zinc, copper, lead, or powder coated aluminium) are fully supported on either insulation or a deck. Throughout this section, these systems will be referred to as single skin metal roof coverings.
- Self supporting double skin metal roof covering – is either assembled on-site or off-site manufactured and consists of liner sheet, vapour control layer (VCL), spacer system, insulation, breather membrane and finished externally with top weathering sheet. They are often referred to as self-supporting double skin metal faced insulating panels or sandwich panels within the industry. Throughout this section, these systems will be referred to as double skin metal roof coverings.

### 11.6.1 Compliance

The specification and installation of metal deck roofing and their ancillary components shall meet the performance requirements of this section.

### 11.6.2 Information to be provided

The Designer shall provide sufficient design details to demonstrate it meets the requirements of this section.

A full set of design drawings and specifications shall be made available to the Warranty provider and all other interested parties prior to the associated works starting on site. This may include:

Where single skin metal roof coverings are proposed:

1. A detailed site specific design from either the manufacturer or the designer (see checklist within this section).
2. A third party product conformity certificate for the single skin metal roofing system where applicable.
3. Details of all materials to be used in the construction of a fully supported single skin metal roof including (but not limited to, the metal sheet, insulation, separation layers/membranes, vapour control layers, structural deck, ancillary components etc.).
4. In all circumstances, the fully supported single skin metal roof will need to be installed by an approved contractor who is recognized by the manufacturer as competent. Evidence of the manufacturer's approval of the contractor to install their products should be provided to the Warranty surveyor.

Where self supporting double skin metal roof coverings are proposed:

1. Details of all materials to be used in the construction of a double skin metal roof including (but not limited to, the metal sheet, insulation, separation layers/membranes, vapour control layers, support system, ancillary components etc.).

The Warranty surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

### 11.6.3 Material specification for single skin metal roof coverings

Single skin metal roof coverings and components used within the system shall be suitable for their intended purpose and the site specific conditions.

All metal sheet roof coverings should be of a suitable material specification and satisfy the following relevant standards:

▪ Zinc and zinc alloys - BS EN 988 and CP 143-5	▪ Stainless steel - BS EN 508-3
▪ Copper - BS EN 1172 and CP 143-12	▪ Aluminium - BS EN 508-2 and CP 143-15

All products and components should be suitable for the intended purpose and have UKCA marking in accordance with UK Construction Product Regulations.

#### Zinc warm roof systems

Fully supported zinc warm roof systems, the product must have a third party product conformity certificate from a UKAS accredited body which covers the complete build-up and clearly details all of the components used.

The certificate should carefully be reviewed by all interested parties to ensure all of the conditions within the certificate are satisfied. Where materials or components have been substituted with alternatives not covered within the certificate, the build-up should not be accepted.

#### External environments

External metal sheets can degrade at a faster rate in coastal locations. In addition, certain chemically corrosive environments, such as sites in close proximity to manufacturing facilities such as chemical works, cement works, copper foundries or coal mines can also cause external metal sheets to degrade at a faster rate.

Where external metal sheets are used within a coastal location (as defined by 'Appendix B') or when they're used in chemically corrosive environments as specified above, a third party product conformity certificate from a UKAS accredited body must be available for the external metal sheet (for both warm and cold pitched roofs).

For the purpose of Warranty, the third party product conformity certificate must be made available to the Warranty surveyor prior to the selection of the system and explicitly state the product has been assessed for use in the environment it is intended to be used and it has at least a minimum life expectancy of 25 years.

In instances where the third party product conformity certificate does not explicitly state the metal sheets are suitable for use in the above environments, the product should not be specified within 5km of the coast or in chemically corrosive environments as it has not been assessed for use in that location.

Where external metal sheets are specified in the above environments, periodic cleaning may be necessary; and a man safe system should be included as part of the design to aid in the periodic cleaning. Advice should be sought from the external metal sheet manufacturer.

## 11.6.4 General design principles for single skin metal roof coverings

Single skin metal roof coverings shall be specified and installed to prevent interstitial condensation, underside corrosion and moisture ingress into the building.

### Avoidance of underside corrosion

All metal roofs are prone to underside corrosion (to varying degrees) by various means:

- Moisture becomes trapped between the metal and the supporting material.
- The use of incompatible materials.
- An inability for the product to develop a protective layer to the underside (Patina).

The following guidance covers how to mitigate the risk of underside corrosion occurring.

### Determination of internal humidity classes

For the purpose of Warranty, 'Humidity Class 3' should be adopted as the internal humidity class for a residential property. In all other instances, the guidance of the Humidity Class table should be used to determine an appropriate humidity classification.

Humidity class	Building type
1	Storage areas.
2	Offices, shops, dwellings with low occupancy.
3	Dwellings with high or unknown occupancy.
4	Sports halls, kitchens, canteens, school classrooms, hospitals, buildings heated with flue less gas heaters.
5	Special buildings (laundry, brewery, swimming pools).

### Deck selection

Deck selection should be based on the humidity class of the building and should be the subject of a condensation risk analysis. For Warranty purposes, the boundary conditions for a condensation risk analysis should be as follows:

- 60% relative humidity.
- Internal temperature 21°C.
- External temperature -2°C.

Where external temperatures are considered to fall below -2°C due to exposure or geographical locations, lower temperatures should be used based upon climatic data within relevant standards.

Where the roof construction is effected by high vapour loads generated by bathrooms, kitchens etc, a condensation risk analysis should be based on these worst case scenarios, which may see an increase to relative humidity levels and internal temperatures.

### Separation layers and low resistance membranes

For the purpose of Warranty, separation layers and Type LR membranes specified in the site specific design must:

- Be as per the system manufacturer's recommendations.
- Where applicable, align with products that are set out within the third party product conformity approval certificate.
- Not be substituted and they should be subject to strict on-site quality assurance measures, which should include but not limited to, verification of product specification.

Separation layers are employed to avoid the metal sheet roof covering from sitting directly on the supporting material. Underside corrosion can manifest itself where either incorrect membranes have been specified, or the correct membranes have been specified but they've been substituted for an inferior product post design approval.

Low resistance (Type LR) membranes, also referred to as 'breather membranes' will be employed in between insulation layers and any ventilated void serving the underside of the material supporting the metal roof covering. Due to the opportunity for increased temperatures created within ventilated voids inherent of the metal roof covering, any breather membrane specified must be tested for use within metal roof covering build-ups.

### Air and Vapour Control Layer

As moisture can accelerate the onset of corrosion to unprotected metal sheets, this creates an increasing importance on the arrangement of vapour control layers within the built element in controlling this risk. Many fully supported metal roofing systems use a product specific air and vapour control layer (AVCL) to reduce this risk so particular attention should be paid to the correct and system specific requirements in this area.

AVCL's should always be on the warm side of the insulation. For continuity of detailing, typically the use of self-adhesive aluminium foil backed modified bitumen membranes is predominant within manufacturer's guidance literature with specific termination detailing for penetrations, etc.

For the purpose of Warranty, the Air and Vapour Control Layer (AVCL) should be strictly in accordance with the third party product conformity certificate and have a minimum vapour resistance between 5000-7000 MN.s.g. All detailing should be strictly in accordance with the manufacturer's guidance literature.

### Compatibility of materials

Underside corrosion can also be caused by incompatible materials being specified together. The table below shows which metals **should not** be used together.

	Al	Pb	Cu	Zn	S.S	G.S
<b>Aluminium (Al)</b>	✓	✓	✗	✓	✓	✓
<b>Lead (Pb)</b>	✓	✓	✓	✓	✓	✓
<b>Copper (Cu)</b>	✗	✓	✓	✗	✓	✗ <sup>1,2</sup>
<b>Titanium Zinc (Zn)</b>	✓	✓	✗	✓	✓	✓
<b>Stainless Steel (S.S)</b>	✓	✓	✓	✓	✓	✓
<b>Galvanised Steel (G.S)</b>	✓	✓	✗ <sup>2</sup>	✓	✓	✓

<sup>1</sup> Steel hollow rivets are not compatible when used externally.  
<sup>2</sup> Galvanic copper plating of galvanised components can increase corrosion development; they do not provide corrosion protection.

It's important to consider both direct contact and surface run off from incompatible materials; for example with the use of rain water goods. If the use of incompatible materials cannot be avoided, they should be separated from each other by either non-conducting, non-metallic isolators (e.g. seals and grommets in fixing systems) or coated with compatible or inert materials.

Timber treated with certain types of preservative, particularly of copper-chrome-arsenic formulation, can cause corrosion of zinc, carbon steel and aluminium in contact with the timber. As such, external metal sheets supported on any timber deck such as plywood must have a factory applied coating specified and be separated from the timber deck by a compatible separation membrane as specified by the system manufacturer.

In addition to the incompatibility issues highlighted above, external metal sheets can also be susceptible to incompatibility issues with other common materials. Zinc for example may be incompatible with materials such as, bituminous membranes, mortar and building paper.

In all situations, the metal sheet manufacturer should be consulted with regards to incompatible issues and this should be highlighted in the site specific design.

### Permitted build-ups

For the purpose of Warranty, the use of fully supported single skin metal roof covering are not permitted in a cold flat roof build up.

In all other instances, a site specific design should be provided as early as possible so it can be reviewed by the Warranty surveyor before any works to the roof covering is started. A checklist is present within this section highlighting the areas the site specific design must cover as a minimum for our Warranty purposes.

All designs should follow best practice as per the guidance available within the UK Guide to Good Practice in Fully Supported Metal Roofing and Cladding, published by the Federation of Traditional Metal Roofing Contractors (FTMRC).

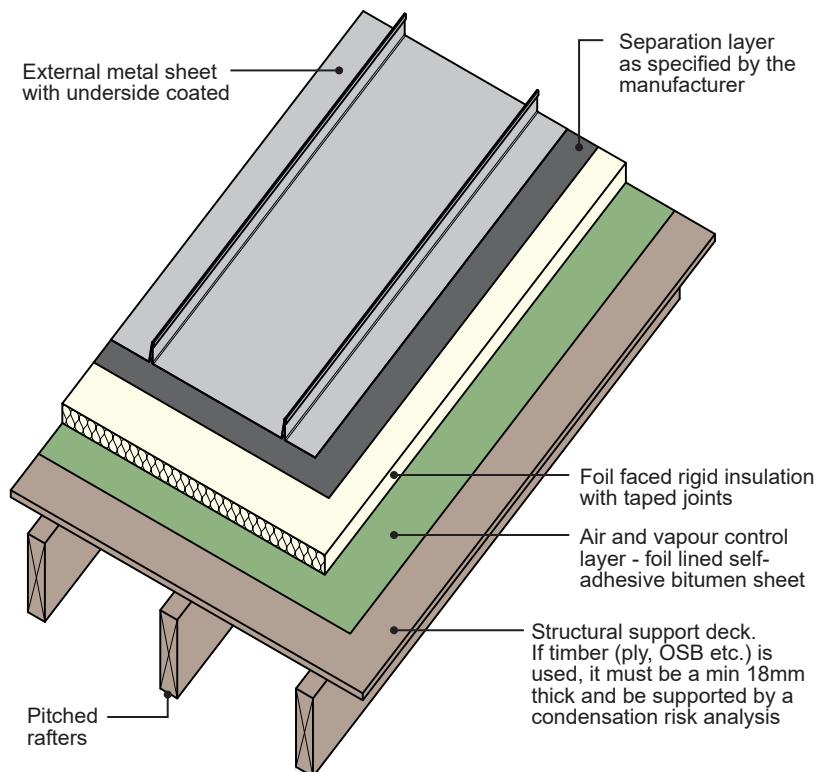
The following illustrations and associated narratives are given only as guidance to typically employed build-ups.

## Warm non-ventilated roof – pitched or flat

Constructed without ventilation provision, the warm deck roof relies on the moisture resistant properties of the fully sealed AVCL that sits beneath the insulation. It is critical that this layer is as specified in the system manufacturers' guidance, with its integrity remaining undamaged during construction.

Any fixings from layers above must be fully considered in design with provisions for sealing penetrations, as untreated, they may give risk to moisture transfer and increase the risk associated with interstitial condensation and a premature failure of both the external metal sheet and supporting material.

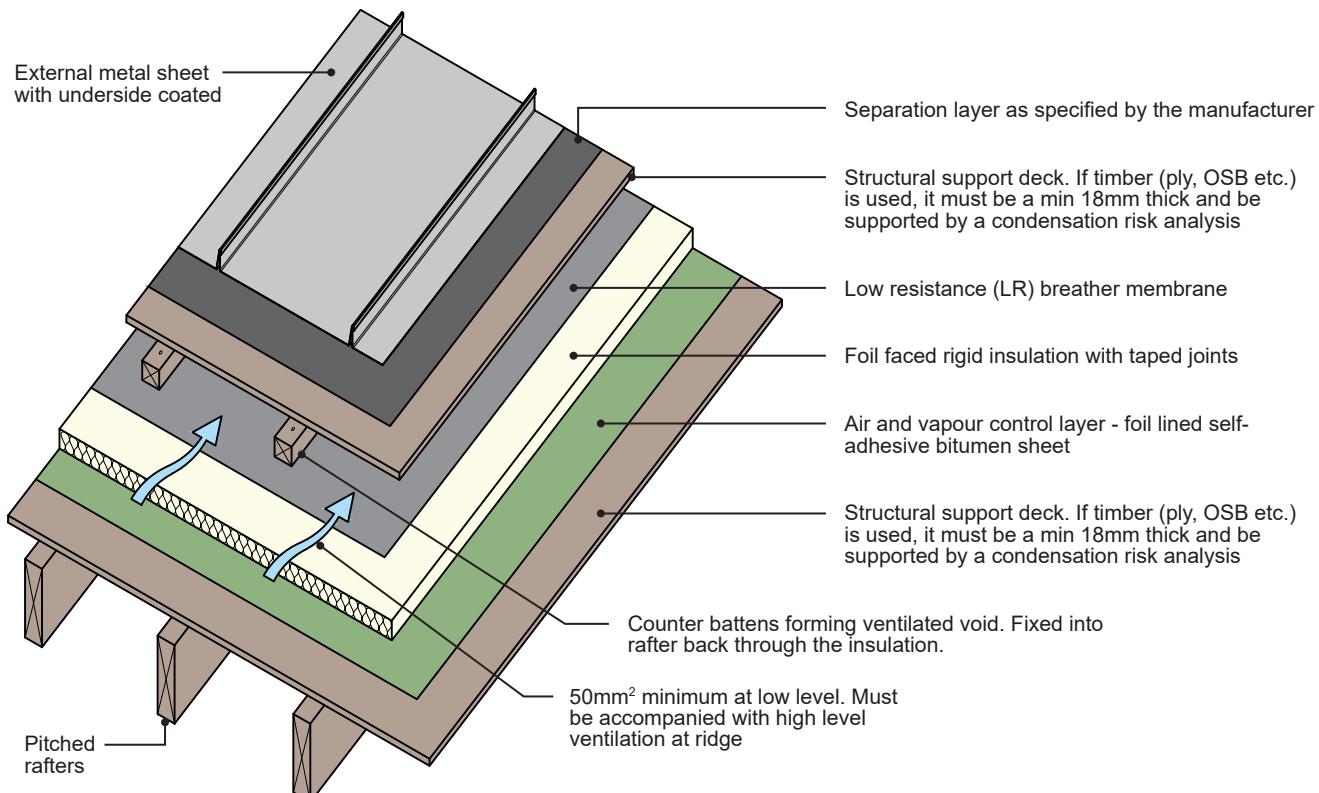
Mechanical fasteners should be avoided above conditioned spaces with high humidity e.g. swimming pools, gyms. This approach, subject to an appropriate supporting site specific design, may be employed on both flat and pitched roofs.

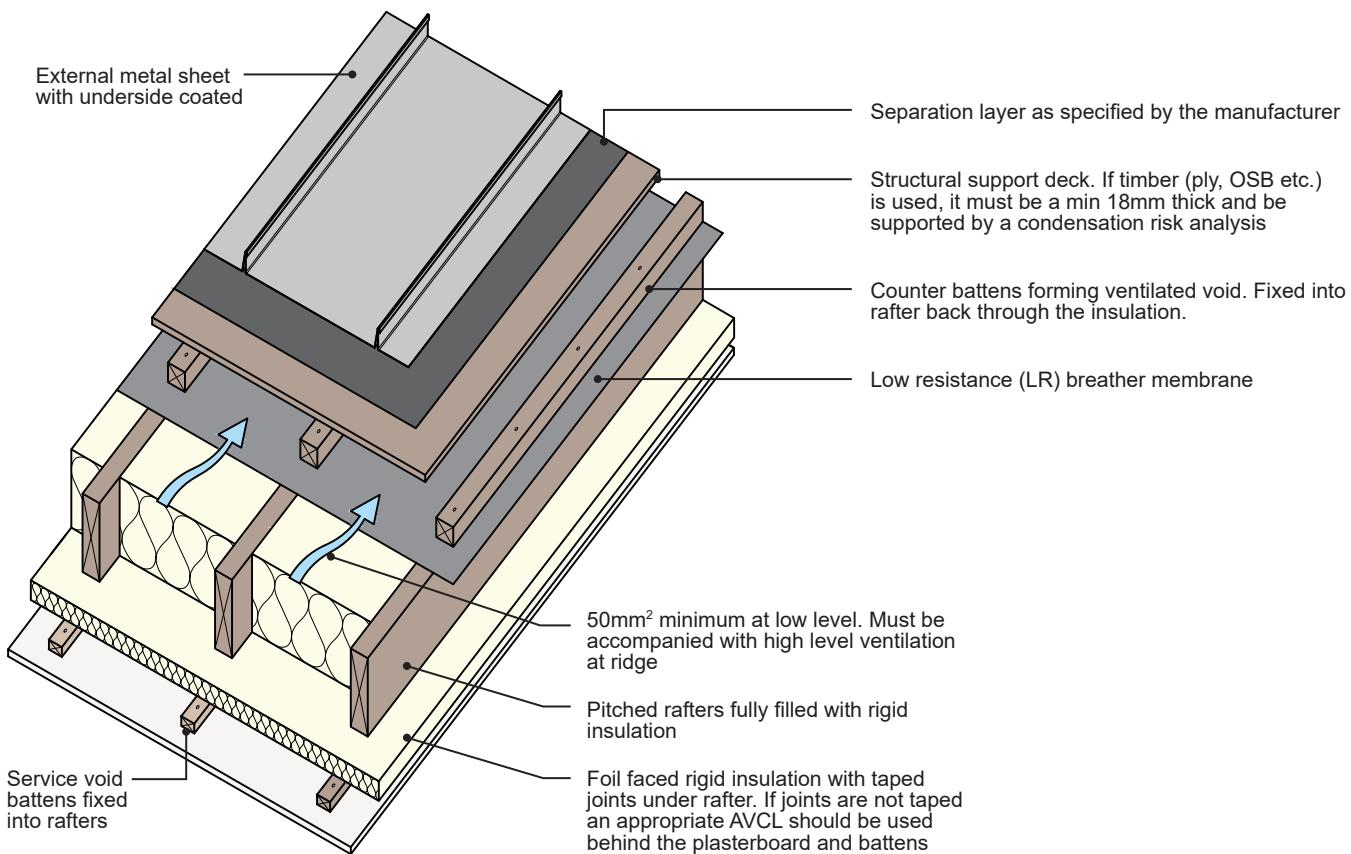


## Ventilated warm roof

The ventilated warm roof arrangement incorporates a well-sealed AVCL directly on top of the structural deck and a well ventilated void between the supporting board to the underside of the external metal sheet and the overlying low resistance breather membrane layer.

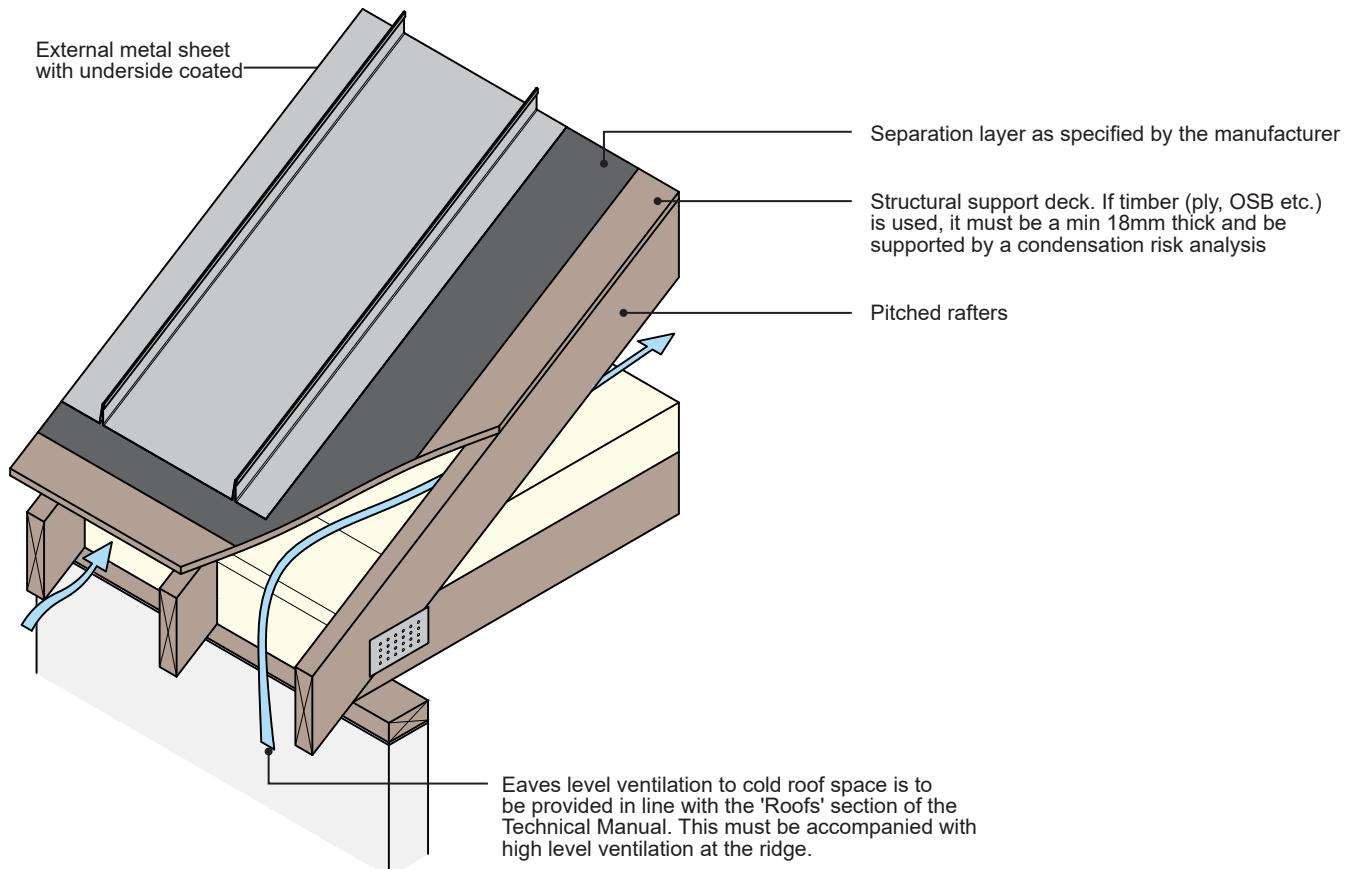
This ventilated roof void allows for any moisture escaping through the fabric to be expelled by a cross flow of air. The span of the roof should be considered when using this approach as larger spans will require an increase to the void depth and eaves ventilation provisions.





#### Cold ventilated pitched roof

The cold pitched roof arrangement requires ventilation at low level and at high level as per guidance in the 'Roofs' section, as the timber deck prevents any warm air escaping.



## Other considerations

### Fire classification

The entire system (not just the external metal sheet) should be assessed to meet the requirements of the Building Regulations, Approved Document B in England and Wales. In particular, the entire system must meet B4 of Approved Document B.

### Deck exposure during construction

Any membrane applied during construction that is left open should be capable of resisting moisture penetration. In the event that a LR membrane is used, the deck should be assessed in relation to its moisture content before any further layers of building fabric are applied. Moisture content of timber boarding should not exceed 20% at point of roof covering being applied.

### Ply bonded on insulation

Ply or timber topped insulation should not be a site formed configuration. Ply or timber topped insulation boards must be produced in a controlled factory environment which holds all the necessary accreditation for production and has a demonstrable quality control procedures to ensure they are fit for purpose. Such documentation may be requested by the Warranty surveyor to prove and demonstrate the above is achieved.

The overall performance of such insulation boards, inclusive of structural capabilities, compatibility and durability should be subject to assessment utilising suitable third party product conformity certificate as a minimum.

### Expansion

If timber such as plywood is used for the structural support deck, movement gaps should be considered for square edged boards at rigid upstands and between boards. A minimum gap of 3mm needs to be maintained between boards and 10mm with rigid abutments.

## Checklist for manufacturer's site specific design for single skin metal roof coverings

As a minimum, the site specific design should include all of the following points:

- The site specific design must reference a third party product conformity certificate for the complete system, not only individual components to confirm this has been reviewed in line with our Warranty requirements. Please note, this is not applicable where we do not require a third party product conformity certificate.
- The location of the development must be reviewed - if the location is a chemically corrosive environment (as described within this section), reference should be made to the third party product conformity certificate confirming it is suitable for use with a minimum life expectancy of 25 years.
- The manufacturer should be consulted with regards to the site specific fixing specification for the external metal sheets.
- Roof build up needs to be detailed to be aligned with the third party product conformity certificate (where applicable) for the complete system, not only individual components.
- A list of components to be used needs to be provided and any incompatible components should be clearly highlighted. Details for methods of separation between incompatible materials (location, type and method of fixing) must be specified.
- Details of protective coating applied to the underside of the external metal sheeting needs to be highlighted (type and thickness of coating). Protective coatings must be factory applied.
- Air and Vapour control layers (AVCL's) should have a minimum vapour resistance of 5000-7000 MN.s.g. This must be detailed in the site specific design.
- A condensation risk analysis must be provided with reference to the humidity class used.

### 11.6.5 Specification for double skin metal roofing

Double skin metal roof coverings shall be of a suitable material specification and be suitable for their intended purpose and the site specific conditions.

Double skin metal roof coverings should be specified and installed in accordance with:

- BS 5427 Code of practice for the use of profiled sheet for roof and wall cladding on buildings
- BS EN 14782 Self-supporting metal sheet for roofing, external cladding and internal lining. Product specification and requirements
- BS EN 14509 Self-supporting double skin metal faced insulating panels — Factory made products — Specification
- BS EN 508 — Parts 1, 2 and 3 Roof and cladding products from metal sheet. Specification for self-supporting products of steel, aluminium or stainless steel
- BS EN 506, for self-supporting copper and zinc
- BS EN 1991-1-1, 3 and 4 for structural loads and be fixed in accordance with the manufacturer's instructions

Components for a double skin metal roof covering system should be in accordance with the system manufacturer's specification. Components should not be changed on-site or by the designer without prior agreement from the system manufacturer.

Top weathering sheets are generally secret fixed onto clips or standing seam sheets onto halters, these being machine seamed once fixed. Pierce fixed sheets are still widely used, which are fixed directly to the spacer system with external visible fixings.

Liner sheets can be solid or perforated to give an acoustic, sound-deadening roof. They are fixed directly to purlins, and can act as a VCL if a separate vapour barrier is not specified. If the liner is not used as a VCL, a reinforced vapour control sheet should be incorporated within the roof.

Insulation must be installed between the VCL and the top weathering sheet; some systems may require ventilation above the insulation and others may not; it varies from manufacturer to manufacturer. Where there is no requirement to ventilate, the insulation should be compressed slightly to ensure that there are no air voids where condensation may occur.

### 11.6.6 Workmanship and installation requirements for double skin metal roof coverings

Double skin metal roof coverings shall be installed in accordance with the manufacturer's recommendations.

#### Top weathering sheets

Ensure that the top weathering sheets are installed in accordance with the manufacturer's instructions.

These must be long enough to discharge into the gutter correctly and allow for an eaves angle if required by the system.

Check that end and side lap tape sizes conform to the manufacturer's requirements.

For pierce fixed trapezoidal sheets, check for tell tales to end laps and side laps for the correct number of rows of tape.

#### Liner sheets

Where the liner sheet is solid and used as a vapour check, note the following:

- Frequency of main fixings to purlins and frequency of side lap stitchers.
- End laps to be sealed with mastic tape; check the size and that this is continuous. Side laps have a wider 50mm Polyband tape placed from the inside so this is visible from above.
- Check for cuts or splits in this metal liner.
- Ensure that to eaves and ridge the correct filler blocks have been used, bedded in mastic; if necessary, a closure flashing must be used from the crown of the sheet to the wall junction to maintain a vapour check. Check the use of sealant tapes and fire-retardant foam.

#### Separate air and vapour control layer (AVCL)

This should be a reinforced sheet, and is used to ensure a more positive air seal around the perimeter of the building. The AVCL should be sealed in the field area with the correct tape, with the number of rows dependent on the application. Check the integrity of these tapes and that they are continuous and correctly joined. Where the vapour check abuts the walls to the verge or eaves, it must be properly sealed in accordance with the Architect's detail. Around penetrations, the vapour check must be cut and sealed to any pipes or upstands.

The spacer system is fixed through the vapour check and liner into the purlins. The spacer system will have a soft sealing pad to ensure the vapour check is maintained around the fixing. Check for punctures of the vapour check by foot traffic or damage, and patch as required.

#### Insulation

Check the packaging to ensure that the correct thickness is being used if one layer is used, or a combination of thicknesses to give the correct specified thickness. For two thicknesses or more, check that all joints are staggered and check the Lambda value against the specification.

Ensure that no packaging or debris is left in the roof void prior to or during the installation of the insulation. The insulation should fill the void or be compressed into the void; there should be no slumping or gaps and it should be packed into voids at the junctions of the ridge and verge.

With standing seam roofs, a rigid mineral slab insulation should be placed at eaves, ridge and around all penetrations and walkways to support the vulnerable areas of the roof, which will give a solid support to the roof sheet pans. This is easy to see during construction and easily felt on completion. The supported pan of the sheet feels solid to walk on.

#### Support system

Check the frequency of brackets against the specification and the number of fixings per bracket, and that they are the correct type of fixing. With standing seam roofs, the halter may be fixed with a stainless steel fixing, check the type and frequency of fixing. Check the orientation of the halter in relation to the lay of the sheet, i.e. will they pick up the seam, as there is a right and wrong way round for halters.

Manufacturers provide halter templates to set out halters, and there must be one on-site to obtain the correct gauging of the halters.

#### Roof penetrations

These must be sealed to maintain the AVCL. Where the liner is used as a AVCL, the metal-to-metal junction must be sealed with fire-retardant foam. With a separate AVCL, this must be sealed to the upstand or pipes with the appropriate tape. Externally with aluminium roof sheets, the junctions with penetrations should be site welded or weathered using glass reinforced plastic (GRP) in-situ weathering.

#### Roof lights

Standing seam roof sheets are usually on separate insulated upstands. With pierce fixed trapezoidal roof sheets, roof lights are in line, either factory or site assembled. Ensure that the correct size of tape is used, check the number of rows of tape that are required and that side lap tapes are not twisted by fasteners.

#### General

Check surface finishes for abrasions, dents and cuts, and that the roof has not been used as a cutting surface for flashings or other metal. Hot swarf from angle grinders burns into the plastisol coating of steel sheets, marks aluminium and rapidly turns to rust. Flashings should have sufficient overlap or butt straps, 150mm wide, and be sealed and supported. Check the frequency of fixings and that they are of the correct type.

## Factory assembled units

Where factory assembled units are used, the following should be checked:

### Fixings

There may be a requirement for stainless steel fixings to be used. Check by inspecting boxes and use a magnet; drill points will be magnetic only. Check fixings are suitable for the purlin type - steel, light gauge cold rolled, heavy gauge or timber - as all fixings are different.

Check the bearing area of the purlin; if the building is not square, the sheets will run out and the end lap detail will not be supported. This can be overcome by using a galvanised support that is fixed to the purlin and which supports the end lap.

Check that the right number of fixings has been used for the panel and the frequency of side lap stitchers; ensure that they are side lap stitchers and not main fixings.

### Sealant tapes

Check the number of rows required by the manufacturer of the panel for end laps. Tell tales should be visible at side laps of each sheet. Tell tales are the ends of the mastic tape run that can be seen or must be felt for at the side of each sheet. The same applies to side laps; there should be a tell-tale at the end of the sheet. Use the end of a hacksaw blade to locate the rows of mastic tape.

On roof lights, mastic tape is visible; check its location, that its size complies with the manufacturer's requirements and that there are the correct number of rows. Tape should not be twisted by the fixings.

### Air tightness

There must be a supply of gun foam, fire rated, at roof level for filling in voids before flashings are fixed. If there is not one on site, air tightness and maintaining the insulation cannot be fully achieved.

The use of foam needs to be inspected during the course of construction, and internal tapes to eaves and ridge purlins need to be inspected for size and position. At the ridge, the gap between panels needs to be filled with foam to maintain the insulation and prevent condensation forming. There also needs to be a suitably sealed inner ridge.

Verge details are difficult and it may be necessary for an internal verge to be cut and sealed around purlins. Check sealant tapes and the use of gun foam to maintain insulation. The manufacturer's details may not be achievable, but an alternative must be devised to maintain air tightness. A degree of confidence in this requirement should be shown on-site as an indication of the importance of air tightness and how this can be achieved.

### Gutter junctions

If parapet or valley gutters are being used, check the air seal at the junction of the two. Gutter joints are not always level, and any gaps have to be filled. This will not only prevent wind-driven rain from entering the building, but will also maintain an air seal.

Check that roof sheets are oversailing into the gutter correctly.

### Roof penetrations

Penetrations such as flues, vents, upstand-type roof lights and sun tubes need to be sealed internally, the insulation being maintained with site-applied foam. Externally, upstands must be weathered correctly and, with steel composite sheets, this is best achieved using GRP in-situ weathering.

### General

Check surface finish for cuts and abrasions.

Check that the roof has not been used as a cutting surface for flashings or other metal. Hot swarf from angle grinders burns into the plastisol coating and rapidly turns to rust.

Flashings should have a sufficient overlap and be sealed and supported. Check the frequency of fixings and that they are of the right type. Check for closure from gutters and sheet oversails. There should be suitable shrouds to prevent birds or vermin from getting into the building, which can be often overlooked.

**Inspection checklist for double skin metal roof coverings**

Component/Inspection	Rectification needed		Comments
	Yes	No	
<b>Check bearing width of purlin.</b>			
<b>Check minimum overlap of linear decking sheets:</b>			
1. Light gauge steel 2. Hot rolled steel 3. Timber - check for minimum penetration			
<b>Check that side laps are stitched at the correct centres.</b>			
<b>Vapour control checks using the liner:</b>			
1. Check tape to side laps, minimum width 50mm air and moisture barrier tape 2. Check tape to end laps 3. Check inner fillers to ridge, eaves and verge 4. Check for sealing around the perimeter with fire-resisting foam			
<b>Vapour control checks using a separate VCL:</b>			
1. Check the minimum overlap is correct 2. Check for the correct sealant tape 3. Check for the correct number of rows of sealant tape 4. Check junctions between VCL and building elements, e.g. upstands, eaves, verge, etc. 5. Check for puncture and repair where necessary			
<b>Spacer systems:</b>			Use a magnet
1. Check for correct height of bracket or halter 2. Correct number of fixings per bracket or halter 3. Check for stainless steel if specified 4. Check for gauging of halters for standing seam and secret fix roof sheets			
<b>Insulation:</b>			
1. Check that the correct thickness is being used 2. Check that insulation is the correct type and has the same properties as specified 3. Check for compression 4. Check that insulation joints are staggered 5. Ensure that insulation designed to support load has been correctly installed to eaves, ridge, penetrations and walkways 6. Ensure all packaging and debris is removed prior to fitting of the roof sheets			
<b>Breather membranes:</b>			
1. Ensure the membrane is laid in the correct direction and in accordance with the manufacturer's instructions			
<b>Roof sheets - standing seam and secret fixed:</b>			
1. Check that sheets are long enough so that water effectively drains into the gutter 2. Check the direction of lay of sheets in relation to the direction of the prevailing wind 3. Check eaves detail, including eaves drips and fixing, in accordance with the manufacturer's details 4. Check ridge detail, including turn up fillers and ridge dams, in accordance with the manufacturers details 5. Check verge detail and adequacy of support for cut sheets 6. Check flashing supports, sheet/verge flashing seals and frequency of fixings			

Component/Inspection	Rectification needed		Comments
	Yes	No	
<b>Roof sheets - pierced fixed:</b>  1. Check overlap dimension 2. Check end lap tape and correct number of rows of tape 3. Check for side lap tape 4. Check quantity of fixings per sheet per purlin 5. Check washer size of main fixings and side lap stitchers 6. Check frequency of side lap stitchers 7. Inspect for correct tightening of main fixings and side lap stitchers			
<b>Penetrations for vents, sun pipes etc.</b>  <b>A - Aluminium sheets:</b> 1. Check sheets are site welded and area post coated where colour sheets are used 2. Check that the VCL and breather membrane are maintained around the welded area 3. Check upstands are at least 150mm  <b>B - Steel sheets:</b> Ideally use GRP in-situ weathering flashings; however, if folded flashings are used, check: 1. Overlap 2. Sealing and fixing of overlaps 3. If a flat sheet back to the ridge is used, check for insulation under the sheet 4. Check frequency of fixings 5. Check sealing of overlapping sheets			
<b>Flashings:</b>  1. Check end overlap 2. Check frequency of fixings 3. Check correct type of fixing is used			
<b>General:</b>  1. Check roof surface for cuts and abrasions 2. Check for hot swarf damage			
<b>Panel laps to be tight when viewed from inside the building.</b>			
<b>Constant straight line on side laps to be achieved.</b>			
<b>Fasteners correct for the purlin:</b>  1. Light gauge steel 2. Heavy gauge steel 3. Timber			
<b>Fastener material:</b>  1. Coated carbon steel 2. Stainless steel			Check with a magnet
<b>Fastener frequency main roof:</b>  1. Main fixings 2. Side lap stitchers			
<b>Fastener frequency roof lights:</b>  1. Main fixings 2. Side lap stitchers			

Component/Inspection	Rectification needed		Comments
	Yes	No	
Bearing area of purlin at end lap; is a supporting bearing plate required?			Is the building square?
<b>End laps:</b>  1. Correct number of rows of joining tape 2. Correct size of end lap tape 3. Correct position of end lap tape in relation to fixing			
<b>Roof light tape positions:</b>  1. Correct number of rows of joining tape 2. Correct size of end lap tape 3. Correct position of end lap tape in relation to fixing			
<b>Is the roof adequately air tight (visual inspection and air tightness test where necessary)?</b>			
<b>Provision of fire-retardant gun foam:</b>  1. Eaves level 2. Verges 3. Gutters 4. Internal verge positions 5. Foam insulation at ridge			
<b>Gutter junctions:</b>  1. Adequacy of seals at gutter junctions 2. Correct provision of weir overflows to gutter runs 3. Correct junction detail between gutters and verge flashings 4. Gaps sealed to prevent vermin infestation 5. Correct discharge of water from roof sheets into gutter			
<b>Roof penetrations:</b>  1. Check seals around cut foam insulation internally 2. Check internal flashing closures 3. Check weather penetrations externally			
<b>Flashings:</b>  1. Check end overlaps 2. Check frequency of fixings			
<b>General:</b>  1. Check roof covering for cuts and abrasions 2. Check for hot swarf damage			

### 11.6.7 Approved installers

The installation of single skin and double skin metal roof coverings shall be completed by an installer who is approved by the manufacturer.

Due to the complex nature of external metal sheet roofing, we require the installer to be approved by the manufacturer.

Where the manufacturer doesn't retain a list of approved installers, evidence should be provided showing the installer is competent and trained with external metal sheet roofing.