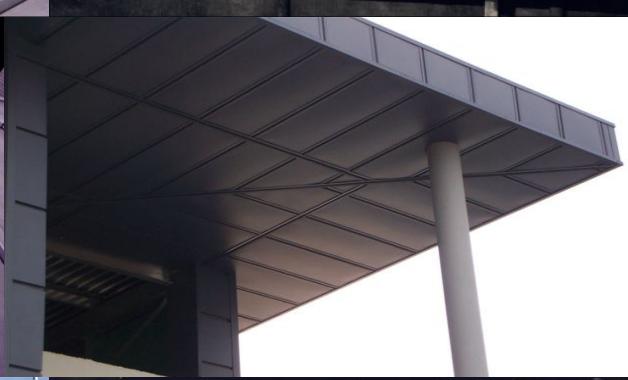
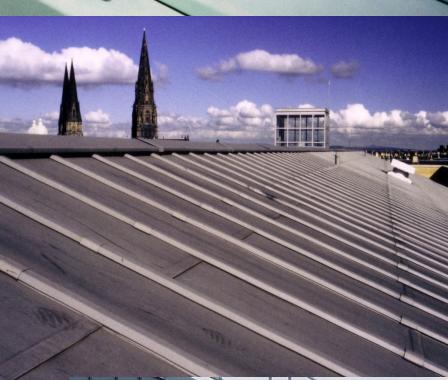


## MCM Systems Ltd



### MCM Hi-Lite System Design Guide



<u>Contents</u>	<u>Introduction</u>	<u>Description</u>
<b>Contents</b>	<b>2</b>	The information in this brochure concerns the MCM HI-LITE system, and how to design, specify and install a roof using this system.
<b>Introduction</b>	<b>2</b>	The MCM HI-LITE system can be part of a built up system. As such there is some variation in the basic specification.
<b>Description</b>	<b>2</b>	<b>Deck of arbitrary type.</b>
<b>Working Characteristics</b>	<b>4</b>	The system can be fitted to most forms of deck from plywood and concrete to profiled metal deck. It can even be used to overlay existing roof finishes such as asphalt and old corrugated sheet.
<b>Durability</b>	<b>4</b>	<b>Vapour barrier and insulation.</b> This is a variable item. 'Cold' specification, with no vapour barrier or insulation required or as 'Warm' specification with vapour barrier and insulation thickness to achieve target 'u' value figure.
<b>Size, Shape and Weight</b>	<b>4</b>	<b>Separation layer</b>
<b>Structural and Mechanical Characteristics</b>	<b>5</b>	Is only necessary where there is no need for insulation and would in fact be a cushion layer.
<b>Applications</b>	<b>5</b>	<b>MCM HI-LITE top skin</b>
<b>Typical Details</b>	<b>5</b>	Pre-fabricated panels with joggled and hemmed end overlaps formed by welding 0.7mm short steel sheet with outer coat of 600 micron thick film to the underside of flexible membrane which is coloured either 'lead', or 'weathered copper'
<b>General roof area</b>	<b>6</b>	
<b>Side laps</b>	<b>6</b>	
<b>Laying out</b>	<b>6</b>	
<b>Eaves gutter</b>	<b>7</b>	
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**Bottle Capping Pieces**

Made from MCM material, these cover and protect the heat welded side lap panel overlap detail and provide a finished joint which resembles a traditional lead roof style roll.

A discreet top hat with membrane pad is supplied for easy non-penetrative fixing of the units.

**Knuckles**

Made from MCM material, knuckles used in conjunction with bottle capping lengths and mid length fixings of same.

**End Overlap Arrangement**

Use of a membrane strip hot air welded to underside of panel end overlap hem in the factory to waterproof end joints and create a wholly sealed sheet eaves to ridge.

**Butyl Strip**

Used as sealer strip between underside of fixing flange of support zed angle at ridges and verge detail.

**Tingles**

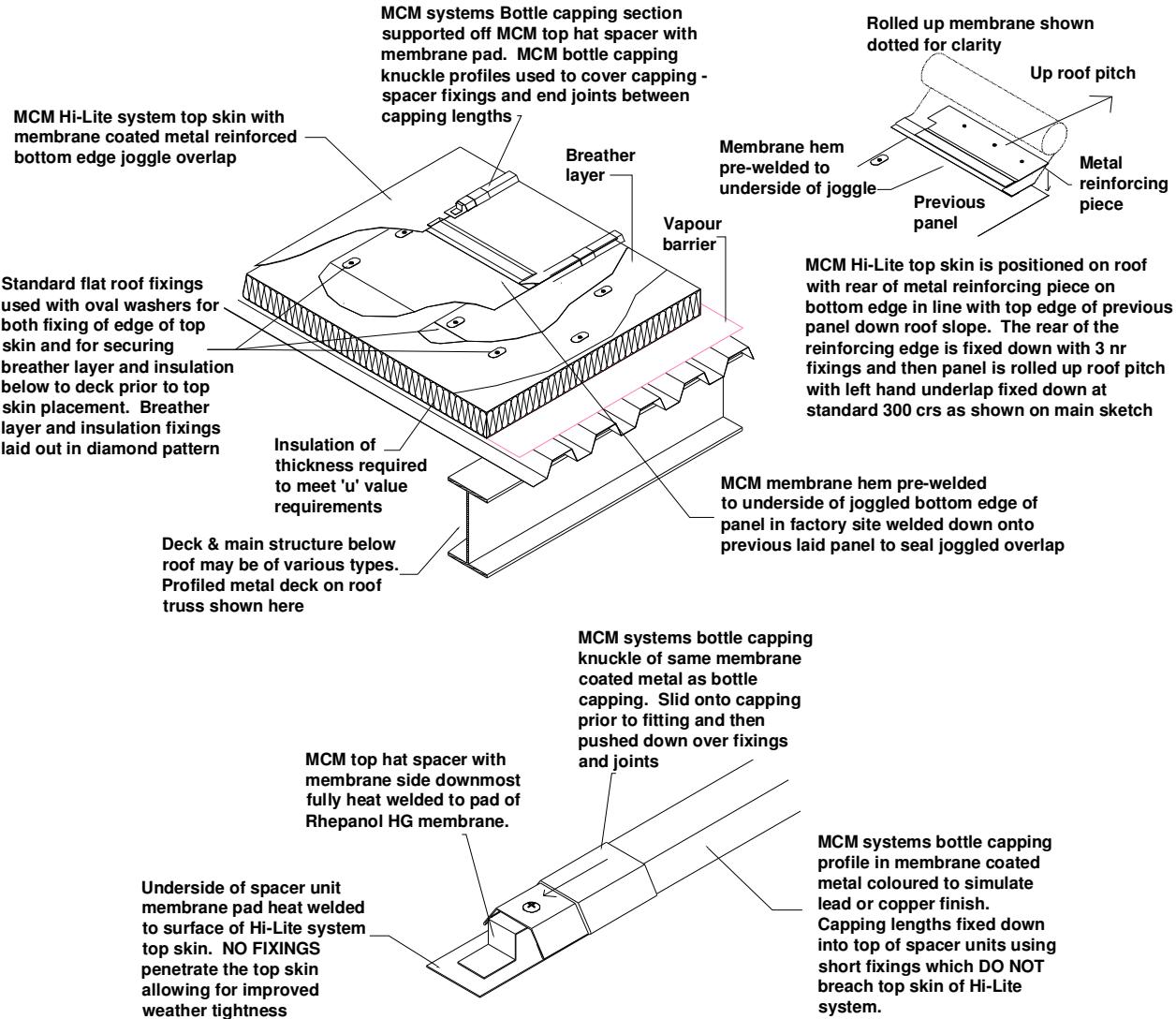
Tongue shaped membrane 'tingles' are used to hot air weld over all exposed fixing heads.

**MCM Detail work**

Full range of developed details are available from low profile hip and ridge to verge, abutment, valley gutter, rooflight framing for various lights to a variety of drip details. A full range of MCM gutter systems are also available with various design options.

**Cover profiles**

Fashioned from MCM material these pre-formed profiles are used to provide a weatherproof dress cover to detail work. Lengths are jointed in a manner that allows for thermal movement. Cover profiles are used in general ridge and hip, abutment and verge details.



## Working Characteristics

The MCM Single Skin system is easy to install. The panels can be readily cut on site using standard single ply tools. The nature of the MCM panel material allows the most intricate details to be waterproofed quickly and easily. Penetrations do not have to be pre-planned, they can be formed on-site where and when required and waterproofed using hot air welding.

## Durability

Properly installed and maintained, MCM HI-LITE panels have an anticipated service life in excess of sixty years.

## Patent

All the MCM panel systems are covered by European Patent.

Patent no. 94303419.9  
The new HI-LITE System  
Patent Application no  
0907341.2

## Size, shape and weight

### MCM Panels

Shell	0.7mm thick galvanised mild steel
Membrane Coating	600 – 1000 micron thick membrane
Standard length	200mm (Includes the hem width)
Standard Width	500mm
Standard panel weight	
Membrane	3000mm long by a choice of widths of 630mm cover or 900mm

### End Overlap Gasket

Material; option 1      Membrane, 1.5mm thick x 60mm wide      (

### Bottle Capping Pieces

Material	0.7mm thick galvanised mild steel with 600 – 1000 micron membrane bonded (as per panels)
Size	2500mm long x 50mm wide x 20mm deep.
Weight	0.75 kg / m

### Knuckle joints

Material	As bottle capping and panels above
Size	75mm long x 65mm wide x 20mm deep
Weight	0.085 kg each

### Butyl Strip

Material	Butyl strip, self adhesive both sides
Size	19mm x 2mm thick

### Tingle

Material	Membrane, 1.2mm thick
Size	25mm wide tongue shaped strip, length variable

## Structural and mechanical characteristics

### MCM material used in panel and flashing manufacture

#### **T-bend test**

The material can be bent flat on itself without the membrane coating cracking, whitening or delaminating.

#### **Scratch test**

Takes more than 4 kg when tested up to the maximum capacity of the BS 3900 / E2 test apparatus.

#### **Corrosion test**

Withstood 1000 hours salt spray to ASTM B.117

#### **Weatherability**

All cut edges are either finished with a welted (folded back flat on itself) edge or fully protected by membrane hot air welded over.

When subjected to QUV weather testing in accordance with ASTM G53, the coating showed no significant deterioration after 2000 hours.

#### **Colour Stability**

Under continuous effects of sunlight and UV the coating showed excellent colour stability and resistance to chalking.

#### **Thermal**

The MCM HI-LITE system is a built up system therefore the thickness of insulation used may be varied to suit the target 'U' value as required by Building Regulations. The insulation is not bonded in any way to the outer skin of the MCM system so there is no question of delamination due to thermal movement or wind uplift

#### Wind uplift / imposed load

The built up nature of the Single Skin system is such that the structural deck supports the build up. Deck type can be varied as required by specification.

Target weight for deck loading from MCM HI-LITE warm roof build up (Specification of Vapour barrier, insulation of 50mm thickness, breather layer and MCM Hi-Lite panel outer skin) would be 10 kg/ m<sup>2</sup>

#### **Fire**

When tested to BS476: part 3 1958. MCM panels achieve a fire rating of AA. This rating was achieved with a variety of insulants.

#### Chemical and biological attack

The MCM material that our MCM panels are manufactured from is not susceptible to insect attack and does not support mould or fungus growth. It is compatible with most of the materials and substances commonly used in the construction of pitched roofs.

#### **Heat**

MCM HI-LITE System has a working temperature range of –20°C to 80°C.

## Applications

The MCM HI-LITE system can be applied to any suitable structural deck including over roofing existing roof specifications. It provides a high quality replacement for most types of pitched roof or wall cladding covering.

## Details

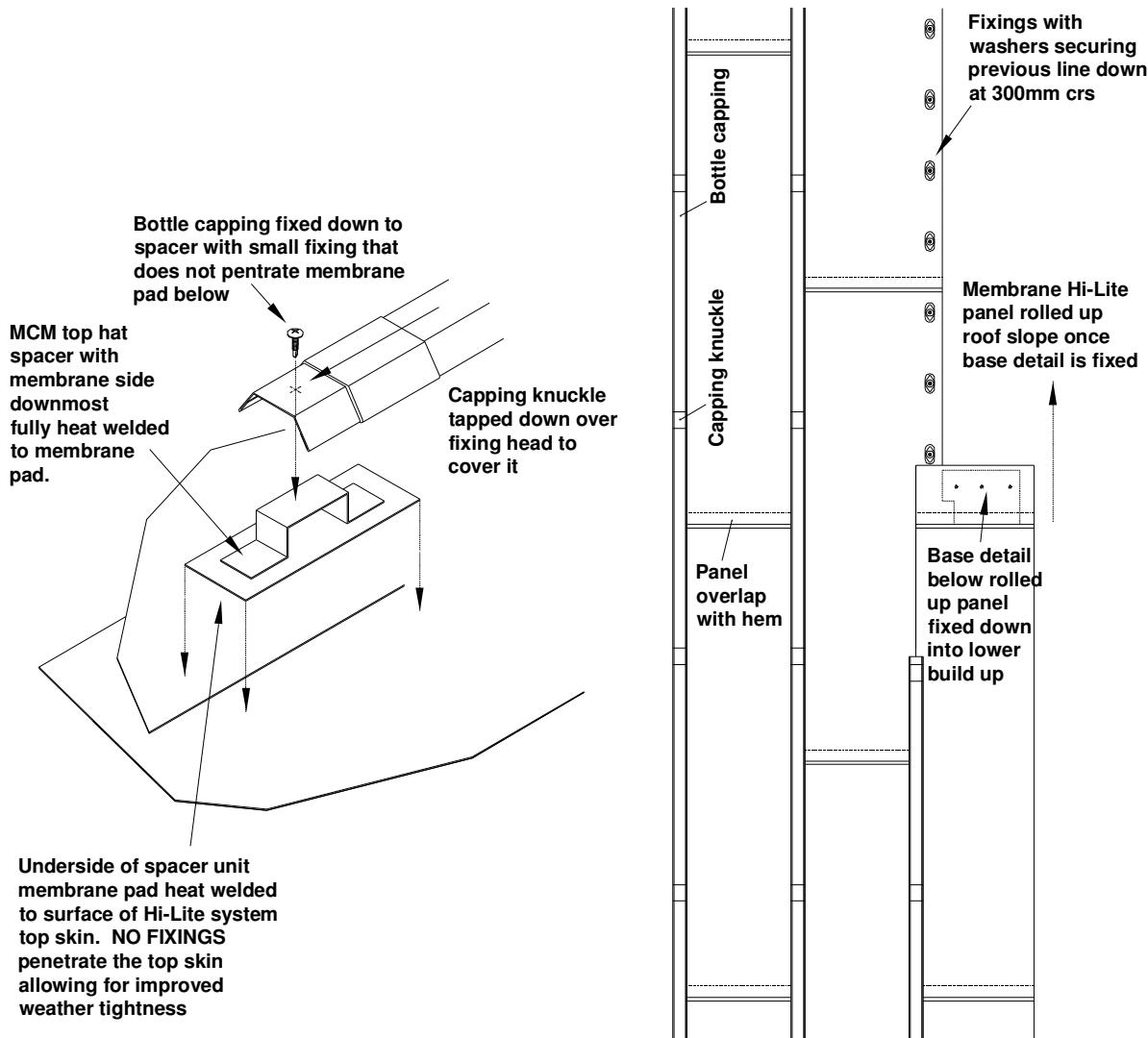
#### Minimum / maximum pitch

The MCM HI-LITE system can be used at any pitch from 5° to vertical.

## Typical details

The following pages give general information on how roofs and wall cladding areas are formed using the MCM Single skin system

### General Roof Area



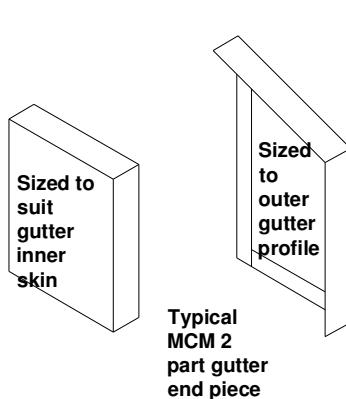
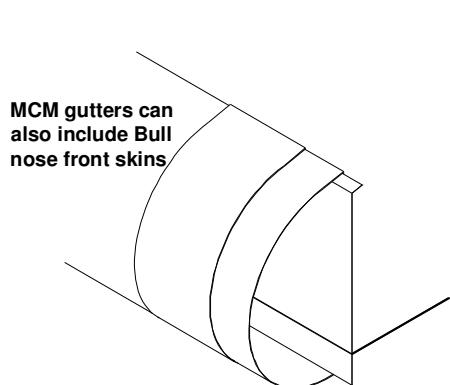
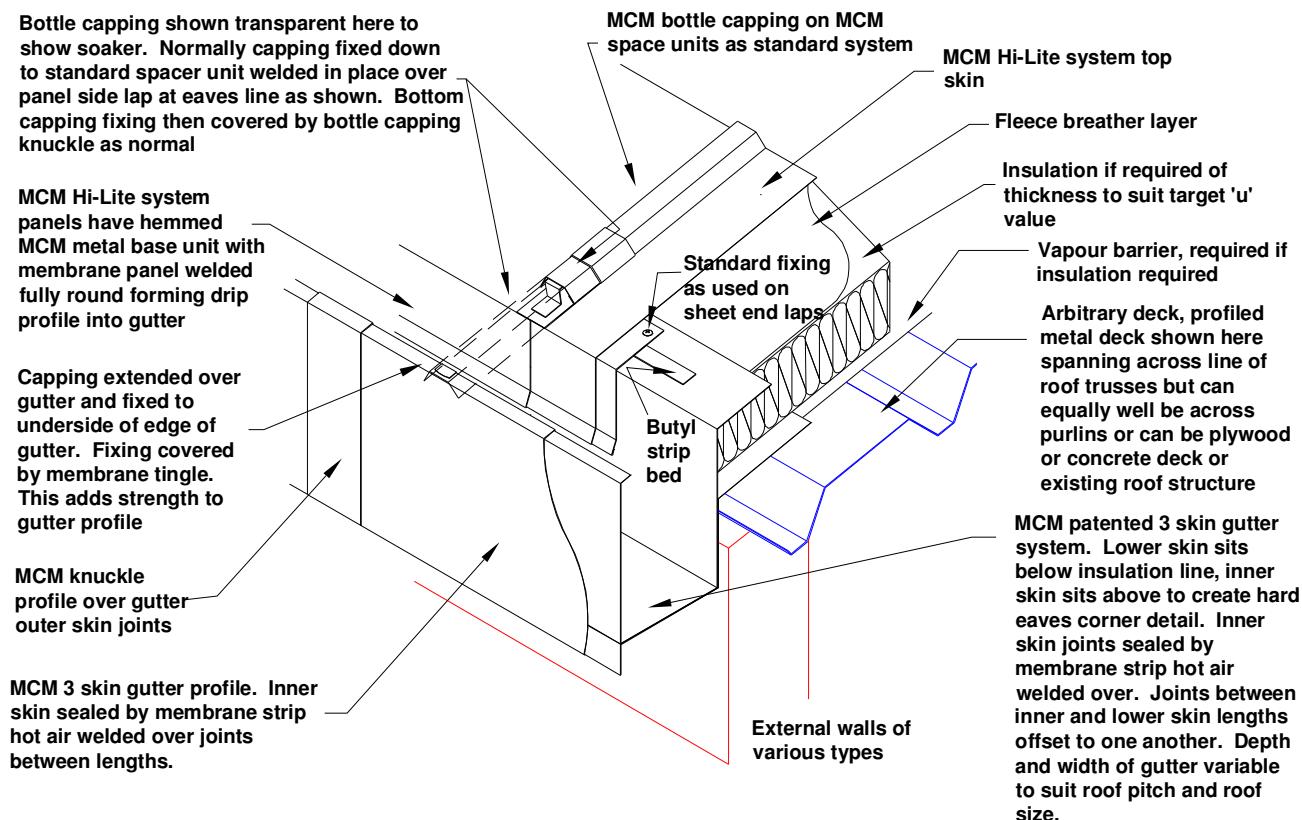
# MCM HI-LITE SYSTEM DESIGN AND SPECIFICATION GUIDE

## Eaves gutter options

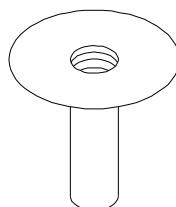
The MCM Systems offer a variety of gutter combinations. The nature of the MCM material allows us to offer a fully sealed self supported gutter system that requires no wall bracket support with all end cap and rainwater outlets included. Our basic 3 skin gutter is detailed below along with end and outlet details and the additional 'bull nose' front skin option.

Our system can easily be combined with fascia and soffit both formed from MCM material for overhanging eaves or can easily sit in front of dress finish fascia and soffit by others. The self supporting nature of the gutter means a clean underside against any fascia with no supporting brackets required. MCM gutters can also be fully formed round corners of any angle and can even be segmented to form a curved effect gutter.

Custom designs of gutters to suit specific appearance or technical requirements are also possible.



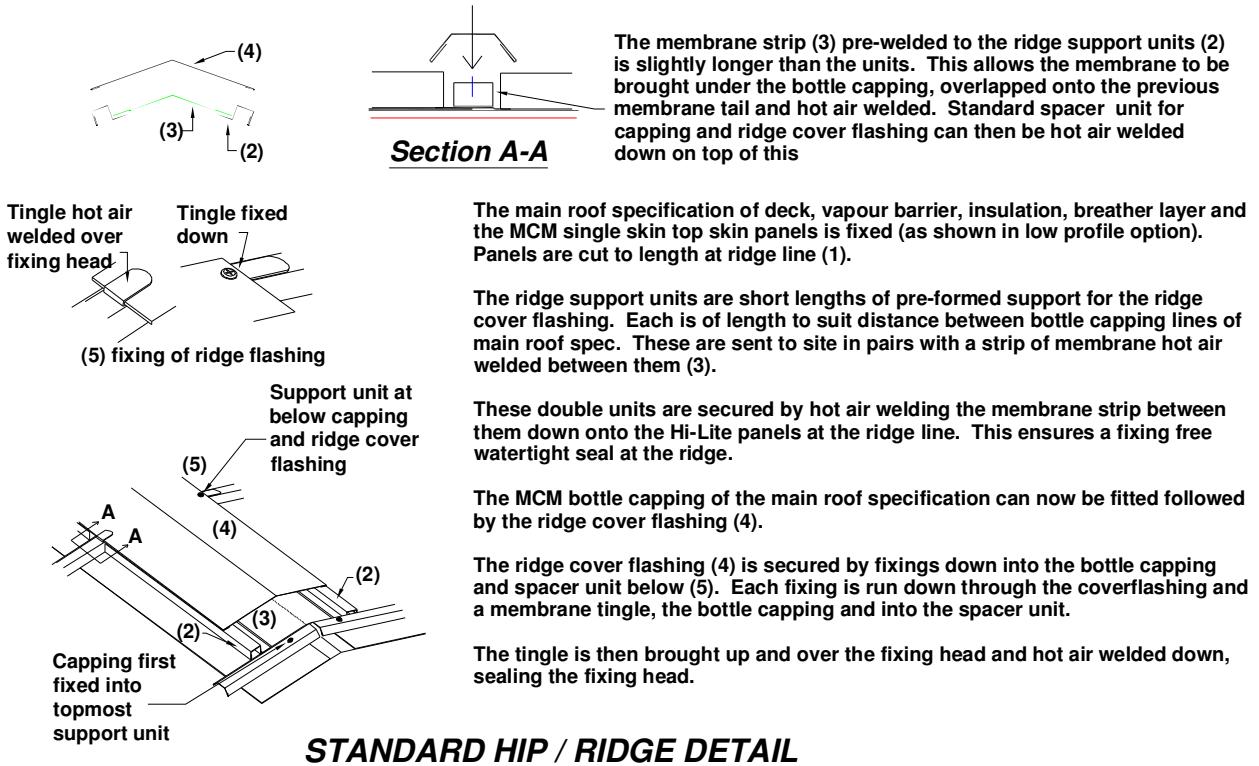
Gutter outlets are formed membrane top hat profiles that are hot air welded to gutter sole over outlet hole. Sizes variable to suit downpipes



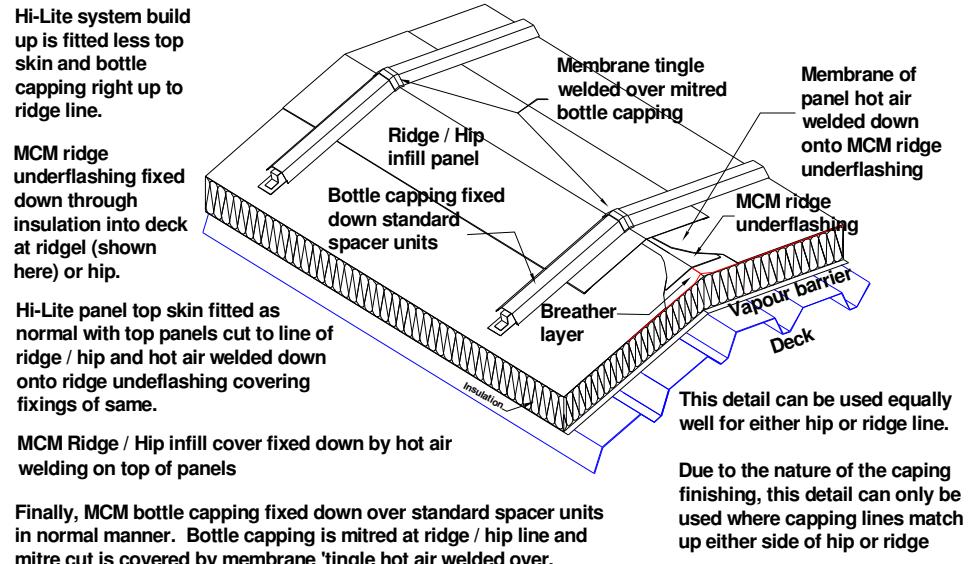
# MCM HI-LITE SYSTEM DESIGN AND SPECIFICATION GUIDE

## Hip / Ridge options

The MCM Systems offer 2 main hip and ridge combinations. As with all MCM details, all cut metal edges are fully sealed as are all fixing heads by use of membrane hot air welded over.



Also as with all MCM details, fully custom hip and ridge solutions incorporating ridge and hip ventilation or mono-ridge options or to suit specific appearances are also possible. Nominal size range of both standard detail cover profile and low profile infill unit are 150 x 150mm to 250 x 250mm depending on roof pitch.

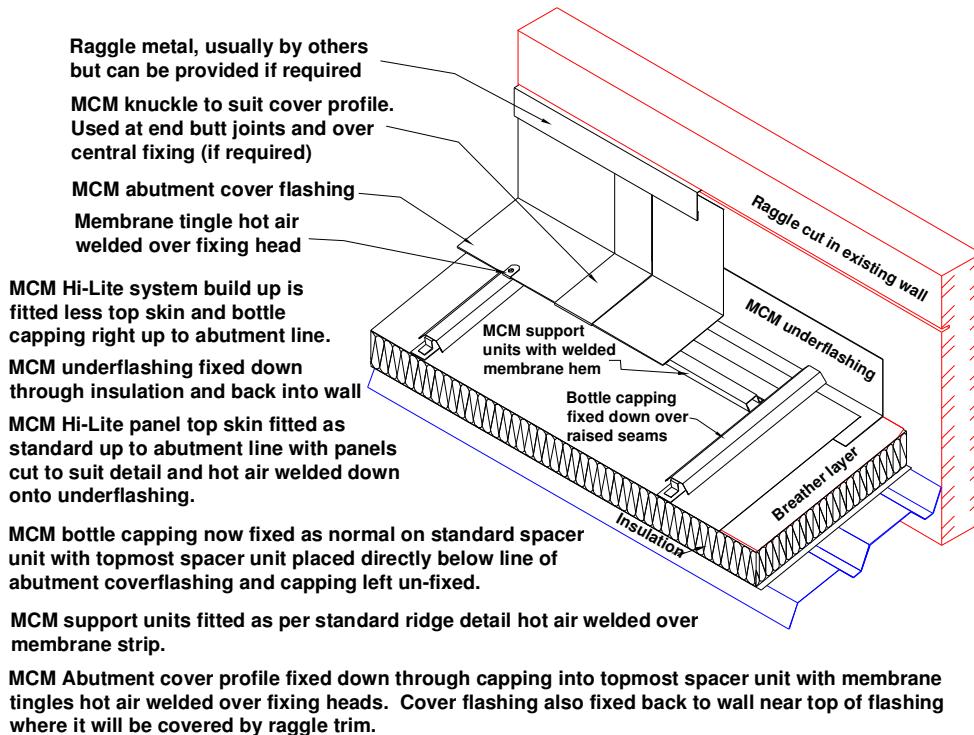


## LOW PROFILE HIP / RIDGE DETAIL

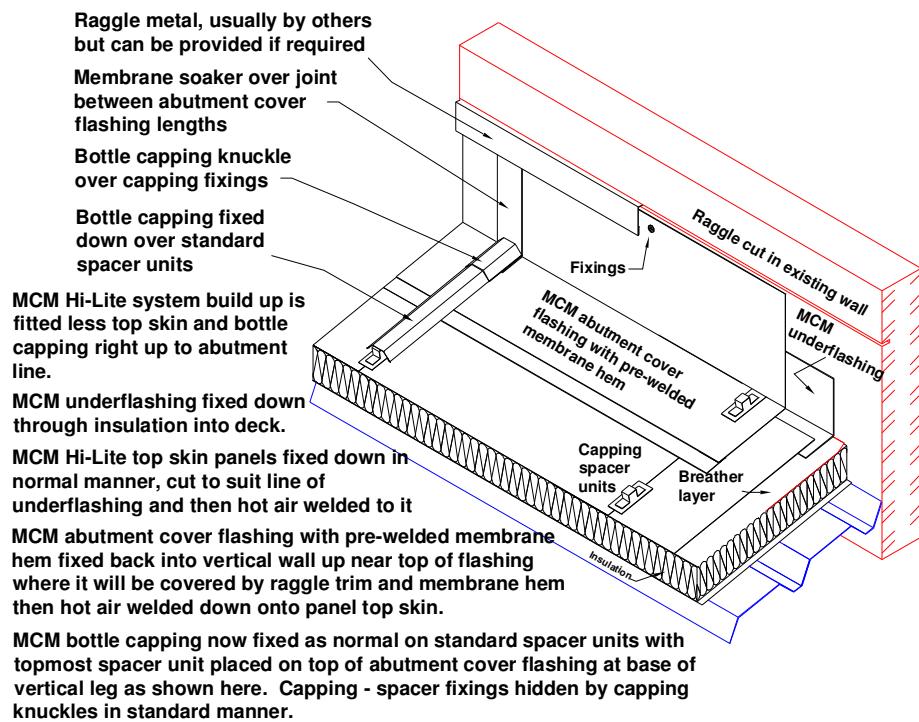
# MCM HI-LITE SYSTEM DESIGN AND SPECIFICATION GUIDE

## Abutment details

Both standard or low profile options also exist for Abutment details.



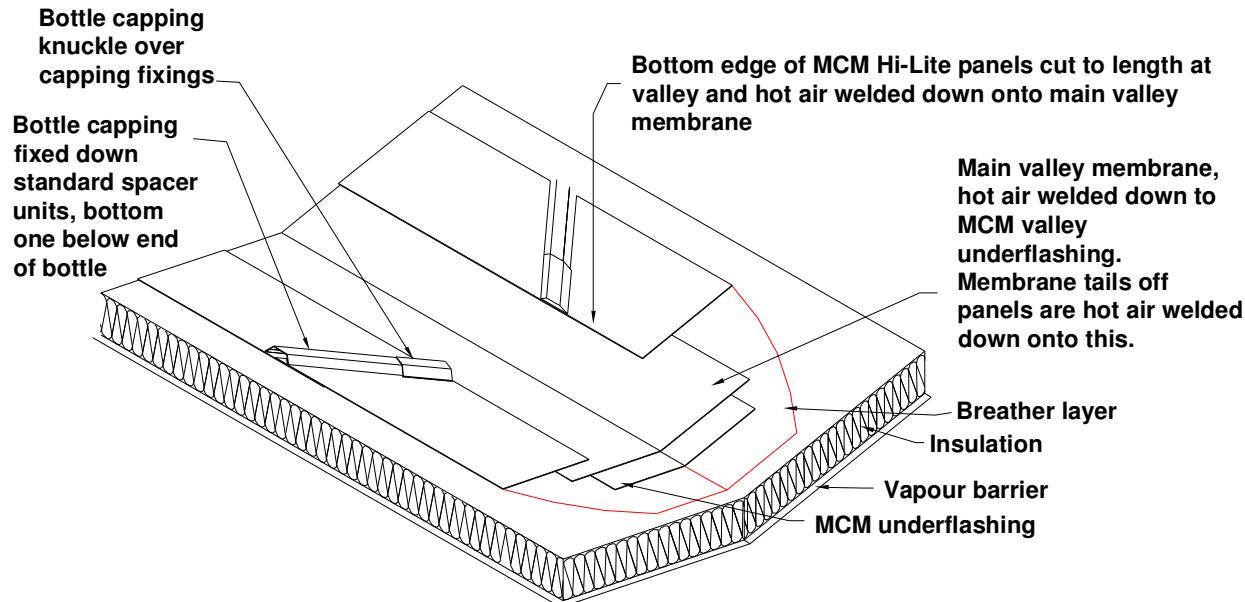
### STANDARD ABUTMENT DETAIL



### LOW PROFILE ABUTMENT DETAIL

## Valley Gutters

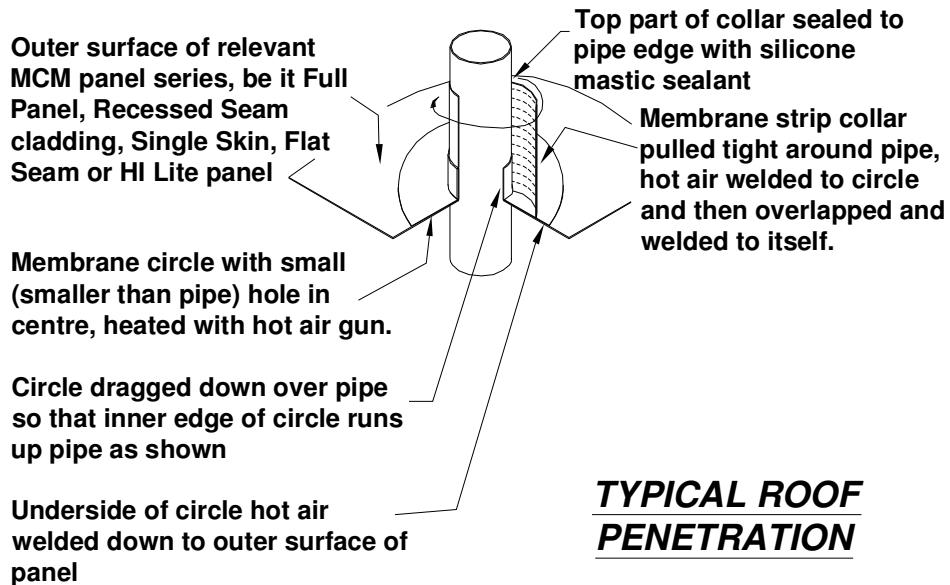
The MCM Single skin valley detail is a site formed one utilising standard angle underflashings and membrane welding. The final width of the valley itself is customisable to suit roof size and pitch.



**VALLEY GUTTER DETAIL**

## Roof penetrations

The nature of the MCM product allows easy and complete sealing of any roof penetrations

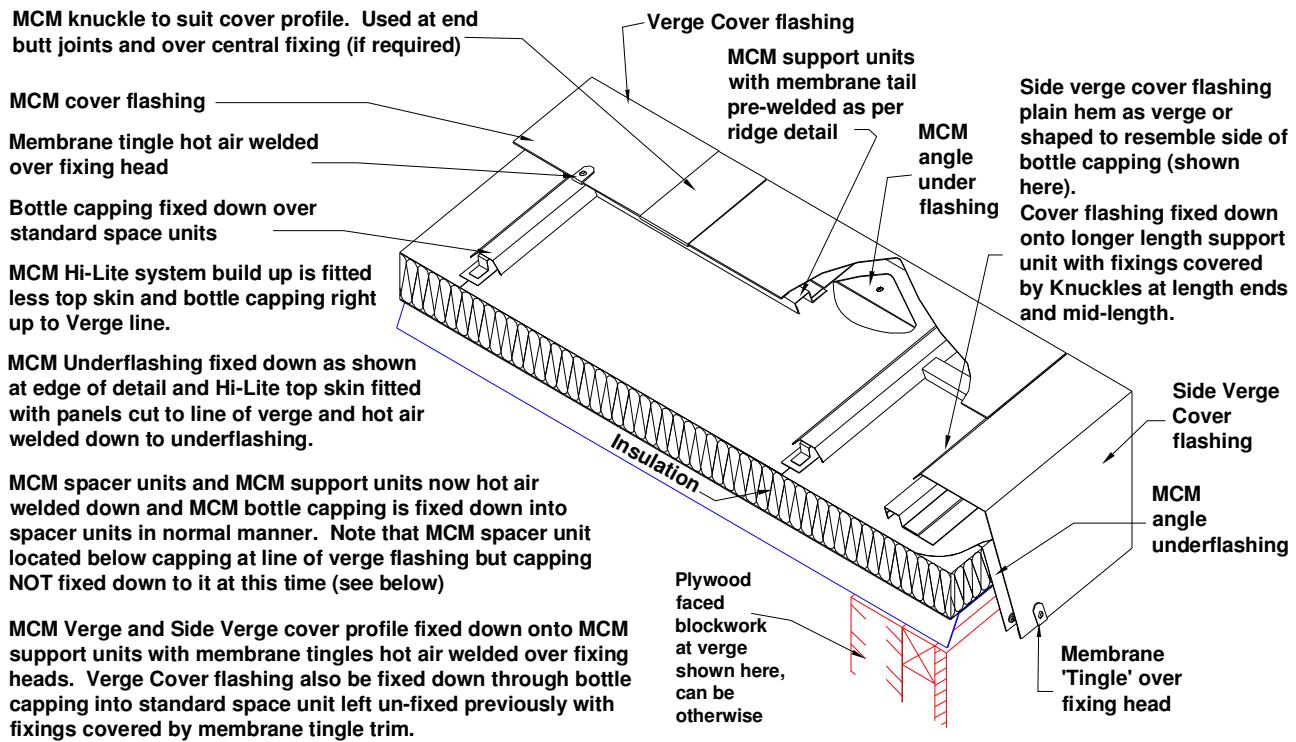


**TYPICAL ROOF PENETRATION**

# MCM HI-LITE SYSTEM DESIGN AND SPECIFICATION GUIDE

## Verge details

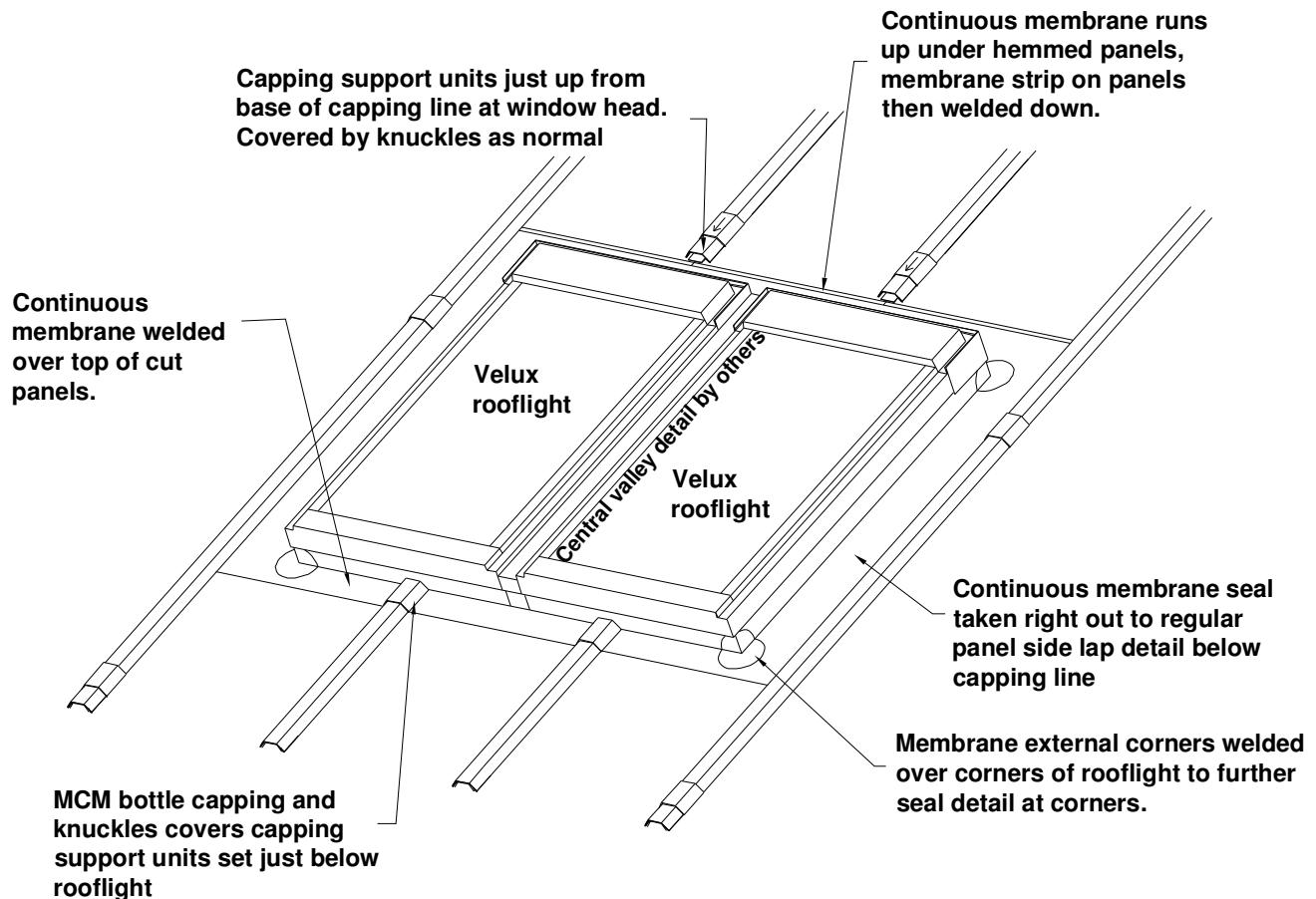
Shown below are typical examples of verge and side verge details but as with all MCM details, Verges can be custom designed to suit a wide variety of requirements. Generally, the vertical depth of the flashing is custom suited to other details such as eaves gutter lines to ensure tidy detail finish.



### STANDARD VERGE AND SIDE VERGE DETAILS

## Rooflight details

The MCM Single Skin system can be adapted to a wide variety of different rooflights from Velux (shown here) to composite triple skin glazing and domed rooflights.



# MCM HI-LITE SYSTEM DESIGN AND SPECIFICATION GUIDE

## Specification

The information contained in this brochure is sufficient to allow the preparation of a complete technical specification for MCM Hi-Lite system. In the UK, the National Building specification (NBS) is commonly used: The relevant section for the MCM panels being as shown below.

### METAL CLADDING: [

Drawing reference(s): [ ]

Supports: [ ]

Bearing width: [ ]

Pitch: [ ]

External sheets: MCM Hi-Lite system

Manufacturer and reference: [MCM Systems Limited (MCM Panels)]

Material :Membrane & membrane coated Steel

Nominal thickness/gauge: [(0.76mm) / 0.7mm Steel & 0.60mm membrane]

Finish/Colour: [MCM ]

External: N/A

Internal: [As primary decking used]

Other requirements: N/A

Accessories: [MCM verge/gutter/abutment flashings/ trims etc. as necessary]

Primary cladding sheet fasteners: [As rec'd by manufacturer]

Fix through profile: [As rec'd by manufacturer]

Number of fasteners per sheet width: [As rec'd by manufacturer]

Eaves and end laps: [As rec'd by manufacturer]

Intermediate supports: [As rec'd by manufacturer]

End laps: [As rec'd by manufacturer]

Sealing laps: [As rec'd by manufacturer]

End and side lap stitching: Fix sheets together with (standard fixings) at not more than [as recommended by the manufacturer] mm centres.

Spacers: [MCM 2 part spacer units with pre-welded membrane pads]

Fasteners: [As rec'd. by manufacturer]

Breather membrane: [Polyester fleece, 1000 gauge]

Thermal Insulation: [100mm PIR Insulation/0.2U value]

Vapour control layer: [Continuous vapour control layer (end and side laps to be taped at joints)]

Acoustic Insulation: N/A

Special Features: [ membranes compatible with all MCM panel systems, to be used in detailing MCM verge/gutter/abutment flashings/ trims/ pipe penetrations etc. as necessary]

## Warranties

The MCM Single Skin System is covered by an extensive range of warranties covering the materials used in the production of the panels, the design of the panels, their application to specific projects and the weather tightness of the completed roof.

## Approved Contractors

The MCM Single Skin System is simple to fit and requires few specialist pieces of equipment to install. However, MCM Systems can only supply warranties when an approved MCM panel installer fits the roof. A list of approved installers is available on request.

## Transport, Handling & Storage

MCM panels are delivered to site on pallets. They should always be stored flat on a clean smooth surface. Panels come stacked 100 nr per pallet and individual pallets should not be stacked one on top of the other.

## Care & Maintenance

There are no special requirements for care and maintenance. Like all roofs and cladding, those formed from MCM Hi-Lite system should be inspected twice yearly and any damage repaired.

The MCM material is easily surface cleaned due to the nature of the bonded membrane outer finish. This along with the fact that very few exposed fixing heads are left once system is installed means that the MCM systems are resistant to many forms of vandalism and damage.

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