

# SIG Roof Lines



## As above, so below

The versatility of zinc is clear at Imperial Tobacco's Bristol HQ, where it moves from roof to facade to become a smart coat that will withstand all weathers

**Crisp lines**, generous bright spaces and high quality natural materials define the £18m Imperial Tobacco HQ in Bristol, designed by architect Atkins, Walters & Webster (AWW) to reflect the corporate standing of the international FTSE top 25 company.

The 100,000 m<sup>2</sup> office is set over four floors, each linking to a generous front atrium with curved white balconies. An executive floor with boardroom and bar opens to a terrace overlooking a large courtyard.

Sustainability is at the heart of the scheme, which includes an energy centre with biomass boiler, over 500m<sup>2</sup> of photovoltaic panels and efficient LED lighting.

The building's highly orthogonal facades are a mixture of glazing, unitised curtain walling and horizontal bands of zinc cladding. The layout is designed to maximise natural daylight for interior lighting of offices, while minimising solar heat gain.

Zinc cladding, supplied as a flat Proteus HR, Honeycomb Metal Rainscreen, matched the project's corporate feel and the local context.

AWW project architect Andrew Boardman told Roof Lines: 'The zinc was appropriate to the local area, which has light industrial buildings and car showrooms. The site was home to Imperial Tobacco's original cigar factory and the zinc seemed to reflect that –

in a more refined, contemporary way.'

AWW had considered using white rendered blockwork walls, but changed tack after seeing the effects of weathering, including staining, on other white rendered buildings. Conversely, the zinc, supplied by SIG, would initially weather, then remain static in appearance for many years.

Two types of metal were supplied: roughly 1,050m<sup>2</sup> of mid-grey coloured NedZink NOVA for the facades, and 700m<sup>2</sup> of a darker grey for walls around the staircores. Both have a pre-weathered, natural matt finish.

'Zinc is a naturally occurring element with a minimum 60 years life expectancy and zero maintenance. A patina forms on the surface to protect the material, which naturally reveals itself,' said Simon Walker at SIG.

AWW was novated to main contractor BAM Construct under the design and build contract. It was responsible for all design intent drawings, and for approving detailed drawings by the cladding subcontractor.

Zinc cladding features predominantly on the southern elevation, surrounding strip ribbon windows with projecting brise soleil designed to reduce the solar gain inside the offices. Zinc covers the sheer walls of the mainly-glazed northern elevation.

The rainscreen is suspended from a

bespoke Kingspan composite insulated panel system, attached to metal stud work on the concrete flat slab frame. The composite panel has a u-value of 0.15 and creates an airtight, watertight envelope before the zinc is applied.

NedZink NOVA panels are arranged in horizontal 400mm-wide strips with a shadow gap to match the dimensions of the ribbon windows. Wider panels were used on the staircores; projecting metal fins also create shadows and articulate the volumes.

'To fit the scheme's crisp design aesthetic the face of the zinc had to be very flat,' said Boardman. 'Zinc planks tend to expand and contract, creating an undulating surface, but we achieved a flat surface by applying the zinc to a 32mm-thick honeycomb sandwich.'

The zinc contributed to the building's BREEAM Excellent rating; it recycles well, scores highly in the BRE *Green Guide to Specification*, and uses 25% less energy in manufacture than aluminium.

AWW was so pleased with the end result, it decided to specify a similar zinc cladding on Imperial Tobacco phase two, an office refurbishment just completed on the adjacent site. 'The zinc ties the two buildings together very nicely, so they look like part of the same complex, even though they are very different in overall appearance,' concluded Boardman.

# Going undercover

It's not just the type of metal, but what goes underneath that matters. Simon Walker, SIG category manager for hard metals, on the dos and don'ts of specifying roofing and cladding

## Decide on your aesthetic vision before choosing the metal

Rather than starting off with a specific material in mind to achieve a particular visual effect, specifiers should first consider broader issues such as life expectancy, buildability, patina, maintenance, and how much the client is prepared to pay to achieve the desired aesthetic. Only then should you seek advice on the right metals, finishes and sorts of installations that can meet the brief.

## Know your metal options

Generally, hard metals can offer a distinctive appearance and a long lifespan because as well as having a self protective patina they are low weight and 100% recyclable. Each commonly used roofing and cladding metal

however has its particular pros and cons. Zinc, for example, is particularly suitable for marine environments, while stainless steel in the appropriate grade lasts longer. Copper, also excellent in marine environments, looks great but is considerably more expensive. (See box).

As well as metal choice, the look of a roof or cladding depends on how it is laid and the type of joint used. If an architect wants something crisp and neat they might be drawn to the flat panels of an engineered facade for example, rather than the aesthetic offered by traditional methods (see box).

## Get the build-up right

Whether you have a cold or a warm roof structure, the right build-up is essential.

One of the biggest issues with zinc roofing is underside corrosion, which can occur if the wrong substrate or build-up has been installed, in particular the vapour control layer. Traditionally, a cold roof build-up with ventilated cavity below the substrate and ventilated eaves and ridge would allow moisture on the underside to be naturally vented out. This is the most common form of roof construction and has kept metal roofs condensation-free for generations. But architects increasingly want to see crisper roof detailing with thinner roof build-ups and so are using warm roof constructions with non-ventilated eaves and ridges. If this isn't built properly it can lead to condensation. When used with a warm roof structure, zinc must have the right protective back coat for



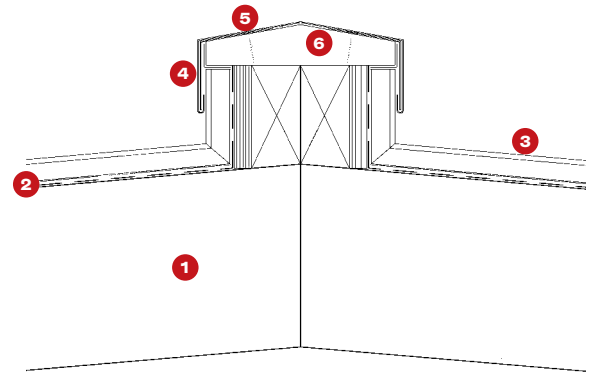
An example of natural zinc sheet roofing brings a crisp finish to roof detailing.

### Drawing annotations

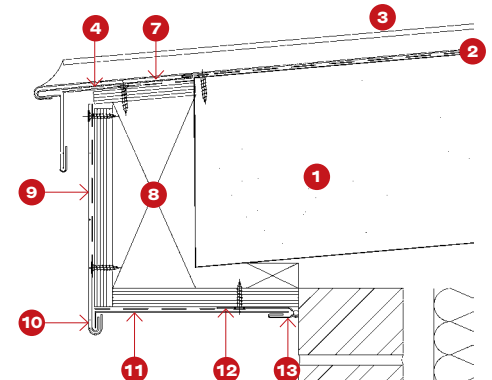
- |                             |                             |
|-----------------------------|-----------------------------|
| 1 Metal composite panel     | 10 Drip flashing            |
| 2 Breather membrane         | 11 Soffit panels            |
| 3 Standing seam roof panels | 12 Abutment flashing        |
| 4 Zinc eaves plate          | 13 Silicon seal             |
| 5 Ridge capping             | 14 Gutter clip              |
| 6 Chamfered ridge timber    | 15 Continuous valley timber |
| 7 Weathering plate          | 16 Box gutter profile       |
| 8 Continuous eaves timber   | 17 Mono ridge flashing      |
| 9 Fascia panels             |                             |



### Typical ridge section detail on composite panel



### Typical unventilated eave section detail on composite panel



moisture control to protect against corrosion, as well as a breather membrane. Without them, it can corrode in as little as six months.

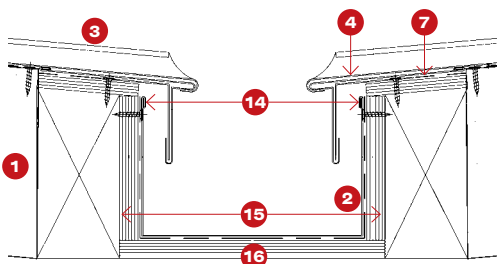
**Beware of breather membrane confusion**

Confusion about the positioning and role of vapour control layer and breather membranes can cause major problems – I have even seen two breather membranes used instead of one of each. But architects can be supported by specialist knowledge: SIG provides an NBS specification, bespoke details and 3D build-up of the installation for the contractor so that everyone knows what is needed.

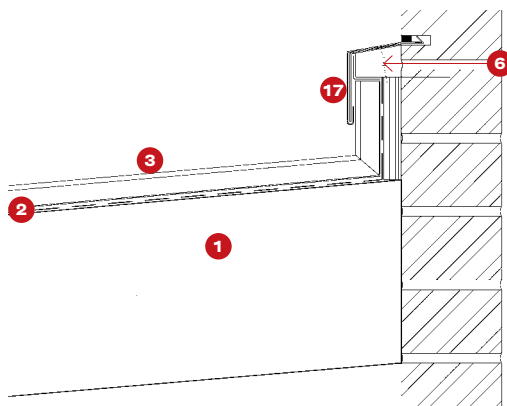
**Choose your installer with care**

This is a massive issue. There is no British Standard for the installation of zinc roofing, so it is crucial to use the right contractor. We advise architects to specify that their metal roof be installed by an accredited contractor such as a member of our DATAC scheme or a member of the Federation of Traditional Metal Roofing Contractors (FTMRC). SIG offers a UK-issued guarantee of up to 25 years for roofs installed by a DATAC zinc and copper accredited contractor, which is peace of mind for client and design team alike.

**Typical unventilated box valley gutter detail**



**Typical unventilated ridge abutment section detail**



The roof aesthetic can also be expressed on the building face, creating a monolithic homogeneity.

**CHOOSE YOUR METAL**

**ZINC:** Excellent BREEAM credentials. Zero maintenance with no painting required. Can last up to 60 years if installed correctly with the right build-up. Particularly suitable for marine environments. Generally available with a natural, pre-patinated or pigmented finish, or with roller applied textures.

**STAINLESS STEEL:** Has a longer life expectancy of up to 80 years at a comparable cost to zinc. It is extremely corrosion resistant and requires no maintenance. Various surface treatments are available although some finishes can ripple slightly, which can be a plus or a negative depending on the look desired.

**COPPER:** Longest lasting with high aesthetic appeal. More expensive up front than other roofing and cladding metals, but its corrosion resistance and lack of maintenance requirement make it more effective than first appears. Widely available in natural, pre-oxidised or pre-weathered green and in bronze, gold and green tones.

**FACADES AND JOINTS**

**STANDING SEAM:** Either traditional or with a longitudinal joint. This gives a 90° instead of 180° fold to give a straighter seam with more uniform joint width.

**FLAT LOCK OR SHINGLE SYSTEM:** Hidden fixing makes this suitable for flat and curved facades. Can accommodate different geometric shapes. Usually used with a vented facade construction.

**TRANSVERSAL JOINT:** Flat lock joint formed by making a 180° fold along each end of the trays to form a 5mm 'jump'. Not as noticeable as the standing seam

**PANEL SYSTEM:** Suitable for flat or gently curved facades with hidden, usually direct, fixing and either transversal or longitudinal joint.

**ENGINEERED FACADE:** Large format, individually demountable panels suitable for all wall constructions.

SIG Zinc & Copper is part of SIG Design & Technology and offers a complete and impartial design and supply service, which covers all eight steps to help create the perfect roof. It designs flat roofs, green roofs, and zinc, copper and stainless steel roofing and cladding.

Find out more at [www.zincandcopper.co.uk](http://www.zincandcopper.co.uk) or call 0845 869 4887

8 steps to the perfect roof

1  
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2  
Design Expertise

3  
Meet the Regulations

4  
Confidence in Supply

5  
Experienced Contractors

6  
Monitored Installation

7  
Full Guarantees

8  
Planned Maintenance

Find out more at [singleply.co.uk/perfectroof](http://singleply.co.uk/perfectroof)



# New take on the old

Pre-weathered zinc played its part in creating contemporary homes that pick up their surroundings' traditional arts and crafts vernacular



ADAM COUPE (2)

**Brightspace Architects'** design for two four-bed luxury houses, located on a steeply sloping site on a main road into Hertford, manages to strike a tricky balance: the client, developer Infiniti Homes, required contemporary properties with high spec materials and clean lines, but there was also a need to acknowledge the local Hertfordshire vernacular, populated by several large arts and crafts-style buildings with steeply-pitched roofs and large projecting chimneys.

Original planning approval, granted in 2011, was for five housebuilder-type homes on a large plot. But seeing a potential market for contemporary design, Infiniti called on the architect to enhance the design and double the internal area of each house as part of a 'reserved matters' application. The first two homes were built in 2013, and proceeds from their sale will fund construction of the remaining properties.

'We were able to achieve a contemporary look by designing large windows in vertical and horizontal arrangements, by building deep basements into the sloping ground, and by layering the facades with projecting brick boxes on the front elevations. The inclusion of pitched zinc roof profiles, set back from the facade and enclosing the upper storey lofts, would mirror other houses in the area with a suburban, traditional feel,' said David Evans,

## Above

The twin houses are modern in aesthetic but have a crafted feel and suburban scale.

## Right

Pre-weathered zinc cladding not only gave a traditional feel, but minimised the thickness of the wall build-up.



## IT'S ALL IN THE DETAIL

This hidden inline gutter detail for a standing seam zinc roof is installed on an eco home in the village of Ashwell in Hertfordshire. The private owner client had stringent environmental performance requirements and targeted an ultra low u-value of 0.11 W/KW/m<sup>2</sup>K for the roof build up. NedZink NOVA, a pre-weathered zinc, was chosen for its sustainability, aesthetics, and longevity. Local specialist contractor RFL metal roofing installed the traditional hand-formed 25mm standing seam. 'Zinc is soft and easy to manipulate and can be adapted to suit the specific application,' said Simon Walker, category manager for SIG Zinc & Copper. 'It is the most malleable of the hard "noble" metals that are resistant to corrosion and oxidation in moist air, which include copper and stainless steel.' Sheet zinc is alloyed with titanium to produce the thin material used for roofing. It is highly durable, and according to International Zinc Association figures the recycling rate for roofing can be as high as 95%.



project architect at Brightspace.

For the roofs a pre-weathered zinc with a rolled standing seam was specified, which would also wrap around the walls of the loft and a projecting box that covered an access stair well and a lift. The material helped deliver the clean lines required by Infiniti and also lent itself to a traditional roof profile, its mid-grey colour blending in with the natural tones of the surrounding homes' tile roofs and green gardens.

'We wanted a natural lead colour with a muted finish that wasn't highly reflective, and didn't want to go down the route of a plastic-coated steel that would create an industrial feel, totally inappropriate for housing,' said Evans. 'The standing seam, arranged in thin horizontal bands across the roof and walls, is a delicate junction that allowed us to create some nice corner and edge details, unlike a profiled sheet that creates a 'wrinkly tin' effect.'

The installed solution and its detailing provided excellent robustness and weathering and removed the need for cladding rails, minimising the overall thickness of the construction build up. 'It ultimately appeased the local authority planners and satisfied the exacting demands of the client – who has a quantity surveyor background as was very hands on in terms of materials selection and cost,' concluded Evans.