



Scientific synergy

Zinc cladding enhances the dramatic form of Bolton College's new STEM (Science, Technology, Engineering and Maths) Centre, designed by IBI Group in Bolton

485m² of SIG's NedZink NOVA was specified as standing seam cladding for Bolton College's new STEM Centre, the seams progressing from vertical to wider angles as they follow the dynamic contours of the entrance. Here, a deep overhang with a zinc-clad soffit gives the 1800m² building a distinctive shopfront to Deane Road as well as providing solar shading for the teaching spaces inside.

IBI Group architect studio associate James Hyde says the architects were looking for a high quality, light-weight product with a neutral graphite grey tone to contrast with the richer composition of materials on the college building opposite, designed by the same practice. NedZink NOVA was the answer for the STEM building, which contains ground floor engineering and automotive workshops with classrooms and laboratories above.

'It suits the context, provides a high quality finish and fits the budget,' says Hyde, adding that the crafted zinc panelling also has a synergy with the hands-on skills taught in the automotive workshops.

'Maintenance was another consideration. We wanted something low-maintenance that was stable and so wouldn't change in colour or appearance.'

NedZink NOVA is used to clad the south and west facades and part of the north. A standing seam application was chosen over a cassette system as this was easier to adjust to the angle changes. These were set out at 425mm centres – considerably smaller than the usual 500-600mm – to minimise the rippling effect of 'oil-canning' on the pre-patinated zinc. Panels are 0.7mm thick, and are supplied with anti-corrosion backing.

Specialist subcontractor Longworth installed the NedZink NOVA and associated substrate works as part of a ventilated cavity build-up, using three or four horizontal rows of panels depending on the depth of the facade. The cladding was applied to timber battens on a plywood surface, with insulation and a ventilation void behind. The whole ensemble was fixed into a steel framing system prepared by the main contractor.

According to Longworth contracts

manager Lee Smith, the main challenge was the need to create angled rather than vertical seams. Setting out the panels to achieve the desired angles proved particularly tricky, especially around the horizontal band of windows. Longworth used its most skilled craftsmen on this project to ensure that the panels were kept at the same angle, and there was no creep with the joints.

'We like NedZink as it is very easy to work with, a little softer and not as brittle as other products. This makes folding the material for swept ends and dressings easier,' says Smith.

During the installation, Longworth cut coils of zinc to the appropriate panel and flashing size in order to minimise wastage, with any offcuts of zinc sent back to its workshop for reuse.

As part of Bolton City Council's Skills Strategy, the STEM college aims to encourage those leaving secondary schools to follow a range of career paths in science, technology, engineering and maths, and the bold new building completes its Deane Road Campus.

Get it right first time

Chris Page, product manager for Premium Liquids & Felts at SIG Roofing, on best practice liquid waterproofing

When to use

Liquid waterproofing can be appropriate for both refurbishment and new-build projects. Since these products can often withstand long-term ponding, they can provide a more stable and durable waterproofing solution than sheeted products with joints that might over time become eroded. Suitable applications include:

Complex roofs

Liquid is particularly suitable for roofs with a lot of detail such as changes of direction, rooflights, pipes and edge details, which may be hard for sheet systems to accommodate. As a continuous surface without joints, it can also be advantageous in locations where aesthetics are particularly important.

Refurbishment and repair

Since liquid waterproofing is seamless and fully bonds to the substrate, it is ideal for use over existing roofing. The building is not exposed to water ingress during application, and there are no disposal costs for discarded roofing. Another benefit, especially for occupied buildings, is that liquid waterproofing can be a lot quieter to install than single ply systems. Properly installed

and maintained, liquid systems can last more than 25 years, and provide a cost-effective alternative to a roof replacement.

Pitched roofs

Cold applied liquids can be applied above pitches of 15°, making it a useful option for roofs combining both flat and pitched areas.

Inverted roofs

Liquid waterproofing is suitable for warm and cold roof systems and for inverted roofs where the membrane is laid under the insulation and ballast, including roof gardens.

Different options

Liquid applied waterproofing systems typically incorporate base coats, reinforcement and topcoats, and systems vary according to the number of coats and stabilisers required. There is a strong argument that the quicker and simpler an installation the better, since the more operations there are, the more chances of errors. The true financial cost of the product should take installation into account; systems that can be applied in a single pass give time and logistical advantages. Health and safety is another important consideration, with the

products types listed below varying in terms of odour, VOCs and other hazards.

Polyurethanes

Moisture-triggered, cold-applied process that typically requires a primer.

PMMA's

This product type involves mixing a catalyst into a liquid and allowing it to cure for up to 40 minutes before typically applying UV stabilised top coat, to give a very tough surface.

GRPs

Glass fibre reinforced polyester resin applied cold on site. Typically it can only be used over new plywood or OSB decking. It is the only option without early rain resistance or resistance to ponding.

Alpha-hybrids

These use moisture in the atmosphere to trigger the chemical changes from liquid to solid. Can be applied in a single sweep, with one installer applying a base coat, embedding the polyester reinforcing, then a further coat to saturate the fabric and then repeating as they progress across the roof.

Hot melt

Delivered in solid form, this polymer modified bitumen is heated in a mixer to 220°C before being applied, reinforced with a felt layer, and topped with another coat of hot melt. Suitable for buried rather than exposed installations, such as beneath a green roof.

Further information on generic types of liquid waterproofing is available from the Liquid Roofing and Waterproofing Association (www.lrwa.org.uk).

Common pitfalls

A liquid applied system is only as good as the substrate it's applied to, so preparation is vital. If the roof hasn't been properly cleaned and primed it is likely to fail sooner rather than later. Most problems such as 'pin-holing' are down to incorrect installation, in particular insufficient liquid. All installers should be trained by the manufacturers to ensure they are fully conversant with the product they're installing. A good installer will monitor the absorption of the liquid, which varies according to the contours, as they work across the roof and ensure the correct amount is applied accordingly.

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 or call 0845 869 4887

CASE STUDY

SIG's Hydrostop EU AH-25 product was chosen to refurbish 450m² of roof at the Sacred Heart Primary School in the Bridgeton area of Glasgow. The project was specified by contractor City Building Glasgow, formerly the building service department of the local authority, as part of a wider refurbishment of the school premises. The school buildings date back to the 1950s. Areas of the roof had been leaking, leading to considerable water damage and disruption to some classrooms.

According to City Building Glasgow assistant investment manager Charlie McLean, the priority for the roof works was to procure a waterproofing system with minimal hot works that would cause as little disruption to the school's everyday activities as possible. The chosen system would also need to be suitable for installation on a distinctively pyramidal part of the school roof. Another important factor was health and safety, both for those installing the product and the school community.

City Building Glasgow chose the Hydrostop EU AH-25 system because it met these criteria and offered additional safety, health and time benefits. A key issue was odour. After using an odorous liquid applied product on another school project, City Building Glasgow was encouraged by health and

safety colleagues to find a product that was less pungent, according to McLean.

'Hydrostop could be installed with minimum personal protective equipment as it has no obvious smells or safety constraints,' he says, adding that installation process was quick since it could be laid on a damp substrate by roller in a single application.

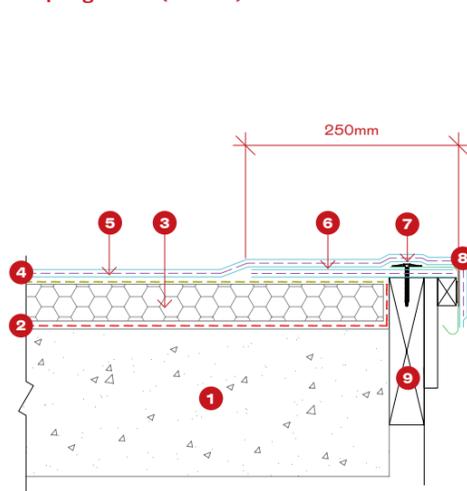
This meant the Hydrostop EU AH-25 system could be installed in just two weeks, with the whole waterproofing project, including the scaffolding, taking four to six weeks.

The Sacred Heart School project was the first time that City Building Glasgow has specified the Hydrostop EU AH-25 system. In preparation for the installation, SIG set up a training facility at the City Building Skills Centre in Glasgow and ran a two-day training course for the contractor and subcontractor in the correct use of its product. City Building Glasgow expects to use the waterproofing system in further school refurbishment projects in the future.

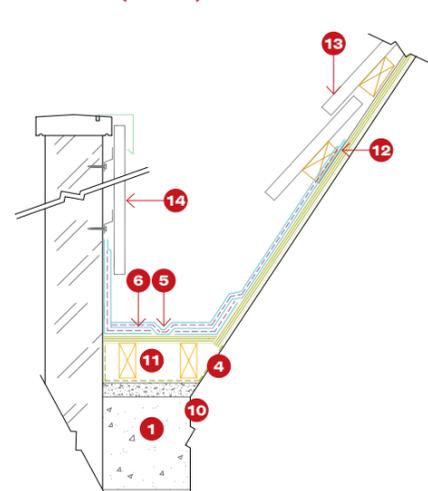
Hydrostop EU AH-25 is a wet-on-wet, cold applied liquid waterproofing product that is reinforced with a polyester fabric. It is free of solvents and hazardous materials, and has a very low VOC content, making it fume-free and virtually odourless.



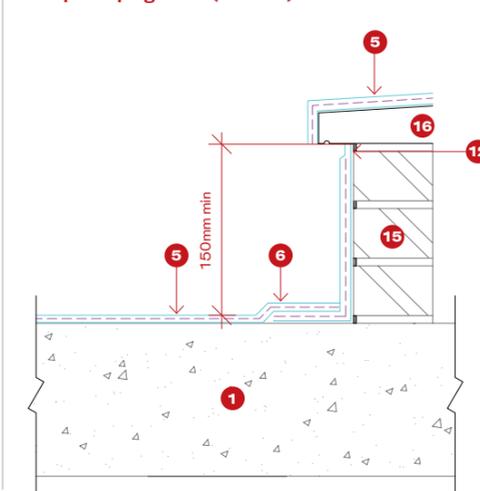
Drip edge detail (notional)



Gutter detail (notional)



Parapet coping detail (notional)



Key to drawings

- 1 Concrete deck
- 2 Existing vapour control layer
- 3 Existing insulation
- 4 Existing felt waterproofing
- 5 New base coat, reinforcing membrane and top coat AH25
- 6 AH25 liquid and reinforcement
- 7 Anti-corrosive fixing
- 8 GRP drip edge trim
- 9 Timber fascia and hard edge
- 10 Existing asphalt
- 11 Gutter sole to create 1:80 achieved falls
- 12 20mm liquid only to waterproofing termination
- 13 Existing slate roof with two courses removed at bottom
- 14 Existing cladding and flashing renewed
- 15 Brick joints grouted flush with brickwork
- 16 Existing coping to be waterproofed if required

Generic product type	Polyurethanes	PMMA's	GRPs	Hot melt	Alpha Hybrid Technology
Product characteristics					
Early rain resistance	Yes	Yes	No	Yes	Yes
Apply in a single pass	No	No	No	No	Yes
Reuse opened container	No	Yes	Yes	Yes	Yes
Cold weather application	Yes	Yes	No	Yes	Yes
Low odour	No	No	No	No	Yes
Non-flammable	No	No	No	No	Yes
Negligible VOCs	No	No	No	Yes	Yes
Solvent and oil resistant	Yes	Yes	No	No	Yes
Resistant to ponding	Yes	Yes	No	Yes	Yes
Cold applied	Yes	Yes	Yes	No	Yes
Single component	Yes/No	No	No	Yes	Yes
Multiple Substrate type application	Yes	Yes	No	No	Yes

ALWAYS CHECK PRODUCT DATA SHEETS AND MATERIALS SAFETY DATA SHEETS FOR PRODUCT SPECIFIC INFORMATION.

It's a team effort

Steve Cleminson, technical manager, SIG Design and Technology, on the best ways to prevent leaks in flat roofs

When a flat roof develops a problem such as ponding, cracks or blistering, the roofing contractor normally gets the blame. But nothing happens in isolation. Preventing costly leaks relies on everyone, from client to installer, doing their job right at every step.

Investigate the options

Rather than just negotiating hard on price, clients should decide what they want from the job and do some research to investigate the different options in order to get an economic fit for the approach they prefer.

Get the design right

I still come across architects who believe flat roofs are flat. Flat roofs should be designed to be free draining and at a minimum fall of 1:40 to achieve a minimum of 1:80 when taking into account building tolerances, mid-span deflections etc. This is in accordance with the minimum requirements identified in BS 6229:2003 (currently under review). Designers should feel free to design at more than the minimum and should design for a realistic, reasonable maintenance regime.

Ponding water can cause major problems, especially in winter, because of temperature variations between the ponds and adjoining dry areas. This can lead to cracking. Getting water off the roof is therefore essential in maximising the leak-free life of products and thus minimising water ingress due to defects or damage. It is also essential for the design to resolve 2D or 3D interfaces with other building elements before installation starts.

Some manufacturers are happy to accept ponding water on their products and believe it will not hinder the product's integrity; however good practice and the BS 6229:2003 advise against it, and it can lead to moss growth and other issues.

Listen to the experts

Early engagement with the manufacturer and installer is key so that their specialist experience can be used. Roofers and manufacturers can provide a wealth of

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Top Temperature variations between ponded and dry areas can result in cracking.

Above: Ponding water can also lead to moss growth and detritus build-ups, both harmful to a flat roof's longevity.

technical knowledge and experience and it's wise to take their advice on board in order to minimise the risk of problems. Engage them as early as possible, ideally at design stage.

Main contractor involvement

If main contractors have a working knowledge of specialist trades, they have a better chance of supervising a successful installation. A number of manufacturers, including SIG, are happy to offer training to main contractors' supervisors/section managers or package managers which helps ensure management not only has some level of knowledge but also access to supporting expertise. Coordinating sequencing and access also minimises problems and allows the installers to do the best job they can.

Use properly trained installers

Training certification is insisted on by most of the credible suppliers – SIG, for example, will only sell products to installers who are accredited with its DATAC (Design and Technology Accredited Contractor scheme) training scheme. Membership of trade associations such as SPRA (Single Ply Roofing Association) or manufacturer/suppliers accreditation schemes are readily available to professional companies who buy into and demonstrate good working practices.

Don't skimp on maintenance

Property owners tend to maintain what they can see and ignore what they can't until there is a problem. We've seen deposits of leaves and moss that look like a green roof, as well as huge build-ups of guano and other debris preventing water draining away, or penetrating the membrane. This can dramatically accelerate the ageing of the installation.

To avoid this, property owners should have a proactive maintenance process including regular inspections, maintaining the warranty, and ensuring accredited contractors undertake repairs with compliant products.