

ProLogis / M&S Bradford

This isn't just any roof, it's a CA roof



Project: M&S Distribution Centre

Client: Prologis and M&S

Project Architects: SGP

Main Contractor: Winvic

Roofing Contractor:

CA Roofing Services

System Manufacturer:

CA Building Products

System: River-Therm® roof,
Twin-Therm® walls

Material: Corus Colorcoat HPS200
Ultra® in Goosewing grey on the roof
and Corus Colorcoat Prisma® on the
walls

Total Roof Area: 95,000m²

Warehouse Length: 515 metres

Warehouse Sheet Length: 178 metres

Benefits:

- River-Therm® roof rolled on site at eaves in 178m long sheets (the longest ever roll-formed on site by CA Building Products)
- Installed and completed in just 12 weeks
- River-Therm®'s unique drainage channel to eliminate the risk of leaks into the building.
- No roof penetrations of any sort
- A fully walkable roof without the need for high density insulation or dedicated walkways
- A PV ready profile, the tenant can install PVs at minimal cost without the

need to mount or bond to the roofs surface

- External roof manufactured in Corus Colorcoat HPS200 Ultra® with Confidex® Guarantee to provide a 40 year maintenance and inspection free guarantee, providing the client with absolute peace of mind
- Reduction of gutter joints by 58%
- Roof, wall, and all insulation classified in its own right as non combustible to LPS1181 EXT-B and will not contribute to the fireload
- A 10 % better than CarbonNeutral envelope from CA Group

Sustainable, CarbonNeutral, A full CA delivery

When ProLogis were tasked with building a new sustainable and carbon neutral distribution centre for Marks and Spencer's in Bradford, they looked to CA Group to provide the full delivery. The 1.1 million sq ft state-of-the-art distribution centre would use CA Building Products River-Therm® on the roof and Twin-Therm® on the walls, expertly fitted by CA Roofing Services to complete the building envelope.

95,000m² roof with a 1.5km radius

The project signified more than 2 years of work by the CA technical department and ProLogis' architectural team, and is a great feat of engineering. The project involved a roof size of over 95,000m² with a radius of 1.5km from eaves to eaves and a pitch of 1.5 degrees. This presented CA Roofing Services the challenge of fitting the longest single roof sheet that it has ever produced; a record breaking 178 metres long.

Often, huge buildings of this type need to be of a certain height at eaves level to accommodate the tall racking system inside, but cannot be significantly higher at the apex of the roof, owing to stringent planning restrictions or fire/sprinkler demands. To get around this problem architects ordinarily design this type of building with several roof slopes incorporating a number of valley gutters, which effectively reduces the overall height of the building. In the case of this new build, the CA technical team worked with ProLogis and their design

Unique Incorporated Drainage Channel



team to both reduce the building height and reduce the number of gutters/ drainage systems to eliminate the risk of water entering the building. They designed a roof that was as close to flat as possible. Owing to this flatness only a standing seam or secret fix roof design was a viable option.

This in itself gave the technical team a challenge as Stuart Brown from technical services explains:

“Due to the sheer scale of this building, the radius of the curve is 1.5 km, which means there is a 20-30 m wide area at the apex which is almost flat because the curve is so shallow. The risk the specifier faces is that rainwater run-off will take approximately 20 minutes to drain from this area into the gutter, so the roofing material must ensure that the exposure to wind and rain over such a large surface area would not risk water ingress into the building.”

Overcoming the Issues

To select a product capable of overcoming this problem the design team had to focus carefully on two areas of the roof where ponding could become an issue. The first was the almost flat section of the roof on either side of the apex and the second was a zone 30 to 35 metres from the eaves up slope.

Ponding

When ponding occurs it adds extra weight to the roof that it may not be engineered to cope with and could cause the roof to collapse. The quicker

you get water off the roof the less chance there is for a leak to occur. Leaks are very costly and time consuming to repair, so the risk of ponding was not acceptable on this project.

In order to prevent rainwater ponding occurring at the apex, coordination between the steelwork contractor, architect and roof supplier was critical. It was imperative to ensure the steelwork didn't deflect leaving a negative fall at the apex and preventing the water from draining away.

Preventing Leaks Through The Seam

Although the main cause for concern was the second zone, 30 to 35 metres from the eaves up slope. Investigations showed that during storm conditions the wind would have the potential to impede the water flowing from the roof into the gutter, allowing ponding to the extent that water levels could rise above the level of the roof profile.

One of the key benefits of all secret fix and standing seam systems is the ability of the side lap to breathe. However where air flow can pass so can water.

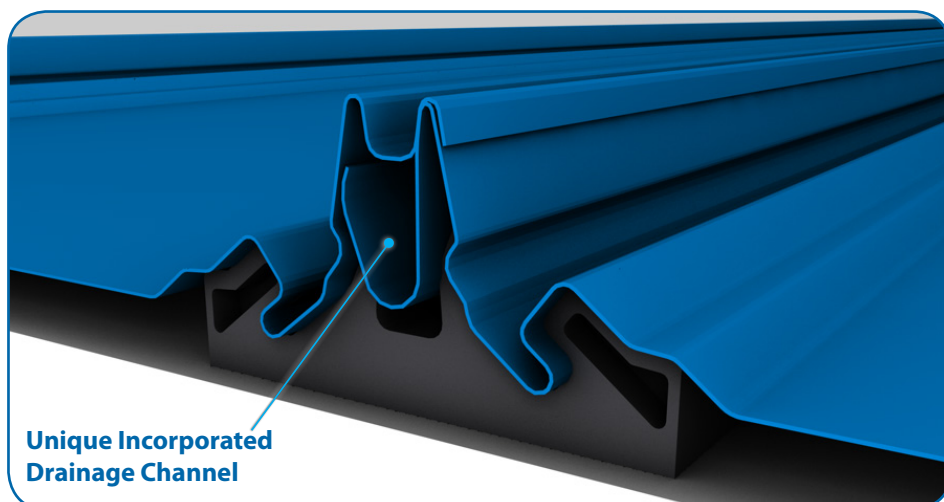
River-Therm®, The Only Useable System

The technical team concluded that the only product that would meet the requirements would be River-Therm®. River-Therm® eliminated the risk of leaks with its engineered side lap incorporating a built-in drainage channel, so that even in extreme cases where heavy, wind-driven rain causes water levels that overflow the top of the profile, any water ingress is channelled away to the eaves and into guttering.

To further reduce the risk of leaks 7.2 metre gutters were installed rather than 3 metre to reduce gutter joints by 58%.

To demonstrate the unique design of River-Therm® and to prove how it would operate in storm conditions, CA invited the ProLogis architectural team to Verona, Italy, where an 80 metre long purpose built test rig is permanently set up to illustrate this issue and to provide visual reassurance of how the self-draining system works, under extreme conditions. A separate demonstration unit resembles a swimming pool with the bottom made of a life-sized River-Therm® installation. When the pool is full, not a single drop appears on the underside of the River-Therm® sheets.

As well as solving the rainwater issue River-Therm® added several other benefits to the project.



Unique Incorporated Drainage Channel

Fully Walkable



Fully Walkable

When installed, unlike virtually any other standing seam roof design, a River-Therm® roof is strong and safe enough to be fully walkable, without any need for specific walkways or high density insulation.

Speed of Installation

The River-Therm® system is very easy and quick to install. It requires no specialist machinery and is installed by simple foot pressure. On this project the 178m long sheets were rolled on site at eaves and the roof was completed in just 12 weeks. This method of installation enables a reduction in impact on the critical path as once the first few sheets have been rolled straight onto the roof installation can begin, whilst the mobile rolling mill produces the remaining River-Therm® sheets, making installation significantly quicker than any other method.

Sustainability

One of the key drivers for ProLogis and M&S was to deliver an energy efficient, CarbonNeutral building. CA Group provide ProLogis with this on all projects as standard through the Corus Confidex Sustain® Guarantee. The full CA group

delivery was manufactured using Corus Colorcoat® pre-finished steel. The use of Colorcoat HPS200 Ultra® and Colorcoat Prisma® as part of the Confidex Sustain® assessed River-Therm® and Twin-Therm® systems provides the client with a CarbonNeutral building envelope. This ensures that all of the unavoidable carbon emissions created throughout the entire life of the system, cradle to cradle, are offset by investing in environmental projects worldwide. In this case M&S demanded a building that was 10% better than CarbonNeutral so the Planet Positive™ scheme was brought in and managed by dcarbon8 carbon and sustainability consultants. The scheme ensured that a further 10% of all the CO₂ expended during the construction of the building envelope was offset.

CA Group also ensure that at the end of the building life all components are either reusable or recyclable. Including the insulation and at today's rates, the scrap value would be slightly in excess of £1/m², whereas with many other insulations costs of £30/m² for disposal are realistic.



Twin-Therm® Walls

The Twin-Therm® package was used on the walls to help seal the building envelope quicker. Twin-Therm® is a site assembled cladding system that provides guaranteed U-values. The systems design and installation method allows for the insulation to be installed continuously, prior to fixing of the spacer system, minimising thermal bridging.

Fire Resistance

The entire building envelope, at no extra cost, as standard has been tested to LPS1181 grade EXT-B. The roof, wall and gutters were insulated with manmade mineral fibre which has been classified in its own right as non combustible. CA Building Products roof and wall cladding systems are manufactured from benign components which produces no toxic or noxious gases and are proven to not contribute to the fireload, which assists both fire-fighters and evacuees as it provides a substantial period of time to help bring the fire under control and to evacuate the building safely.

Complete CA Group Delivery

This project benefited from a full CA Group delivery combining expertise from both fields to make the build as successful as possible.

CA Roofing Services have a wealth of experience on a multitude of projects and fitting many types of products, making them ideally suited to produce the groundbreaking work the project required.

Twin-Therm®
River-Therm®

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Complete CA Group Delivery

