Bateman's Tower Café, Brightlingsea

Client:
DG Timber Solutions Ltd.

End Client:
Bateman's Tower Café /
Brightlingsea Town Council

Designer & Main Contractor:
Eco Pavilions

Architect:
Hancock Architecture

Products used:
Protect Thermo Extreme
Protect VC Foil Ultra
Protect sealing tapes

Project Overview

An innovative design and build project was undertaken to construct Bateman's Tower Café, which has been situated at the furthermost point of Brightlingsea's coastline for over 40 years, with a view to spearheading a major regeneration of the sea front area whilst maintaining an alfresco dining and user experience. Already an integral part of the local community and part of the social fabric, this prestigious café development involved the design of an amphibious building that could withstand the regular buffeting by high winds and wintry temperatures on a busy sea front.

Expected to be completed in 2020, this innovative two storey design was conceptualised with eco-architecture in mind, with an environmentally conscious, Scandinavian-led ethos to ensure the building was future proofed and could adapt to environmental change. Housed inside a danger zone of a 50 year flood cycle, sheltered inside the protective rise of the sea wall and perched on a terrace above sea level, this development had a key objective to withstand constant exposure to weather and provide a sustainable solution to an ever changing climate.

Constructed with a light connection to the ground and floating on a system of vertically-guided, water-displacing floor modules, similar to a boat moored at a jetty, the building needed to be future proofed with an engineering capability for the finished floor level to rise to the height of the top of the sea wall in the event of flooding, 4.5m from sea level.

The use of external and internal membranes was an important element to this project in order to ensure the key requirements of watertightness, condensation control and thermal efficiency were met.

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The Challenge
DG Timber Solutions, specialist designers and manufacturers of timber frame construction were awarded the contract to build the structure's wall panels in the factory and install on-site, with the objective of achieving an overall wall U-value of 0.20W/m²K.

With the structure being located in a coastal and sea front area open to high winds and driving rain, the challenge for the specification of building materials was to find an external breather membrane with a W1 water penetration resistance in alignment with the Structural Timber Association's STA Advice Note 18.

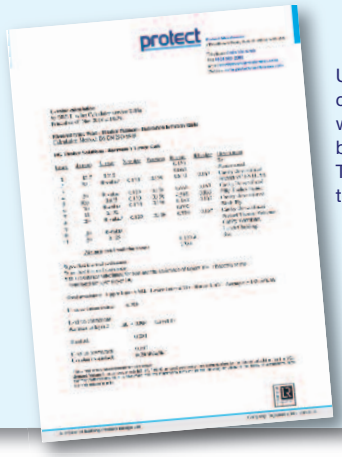
A product was required that could withstand these extreme conditions whilst the external wall was exposed during the construction phase, whilst also delivering sustainable aged thermal performance. On the warm side of the insulation, a thermally efficient vapour control layer was also needed to manage condensation risk and ensure airtightness at internal junctions. DG Timber Solutions contacted Protect Membranes to consult on the best product solution to meet these testing requirements.

The Solution

Following technical discussions with DG Timber Solutions, Protect's Technical team undertook both U-value calculations and condensation risk analysis on the proposed wall build-up, incorporating specific Protect products, in order to deliver the required thermal efficiency and achieve the U-value target, whilst ensuring water tightness on external walls in the severely exposed location.

The proposed solution was to incorporate Protect Thermo Extreme, a highly reflective, insulating breather membrane with a resistance to water penetration of Class W1 to BS EN 1928. This was designed to be used with the reflective surface facing into an unventilated external wall cavity, combined with the internal use of air and vapour control layer Protect VC Foil Ultra facing into a 20mm still airspace, sealed with Protect tape for airtightness. This thereby helped to ensure heat would be retained in the structure.

The proposal was agreed by DG Timber Solutions and the main contractor, with Protect Thermo Extreme then installed externally on the timber frame panels in DG Timber's factory under controlled conditions and Protect VC Foil Ultra fixed on-site, post service installation. The combination of these two products helped to ensure the thermal enhancement for the structure was achieved, along with all the usual hallmarks of high performance as expected with Protect products.



U-value calculations were provided by Protect's Technical team.

Products Used

Protect Thermo Extreme – aligned with STA Advice Note 18 and fully independently certified by BM TRADA, this reflective, breather membrane used externally achieves a Class W1 water penetration resistance for suitability in severely exposed areas. Featuring a micro perforated upper surface to ensure the membrane meets the permeability requirements recommended by TRADA and NHBC, the product incorporates high quality aluminium to generate a low emissivity surface. Thermo Extreme offers an aged thermal resistance R-value of 0.77m²K/W (using typical 600mm timber stud centres, including printed logos). This helps to deliver a 328% improvement in thermal performance (horizontal wall heat flow) when used with a minimum 20mm still airspace, compared with a standard non-reflective membrane.

Protect VC Foil Ultra – this highly reflective air and vapour control layer, independently certified by BM TRADA, is used on the warm side of the insulation, offering an aged thermal resistance R-value of 0.78m²K/W and an unaged result of 0.81m²K/W (both values incorporating printed logos). This unaged result can be used for U-value calculations if the vapour control layer is being used in a low humidity environment as per BS EN 15976. Helping to avoid condensation risk in accordance with BS 5250, the low emissivity surface enhances thermal performance when used with a still air cavity.

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Clive Darrington, Director at DG Timber Solutions commented, "The membranes used from Protect tick all the boxes of performance for this unique café development. As the building is sited in a particularly harsh and exposed coastal climate, it was critical that the outer membrane Protect Thermo Extreme offered a primary line of protection to the whole of the external wall during the construction as well as providing enhanced thermal resistance to meet our target U-value. Combined with Protect VC Foil Ultra, which we have tried and tested over many years, this ensured condensation risk was managed and controlled."

protect

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