

A TITANIC achievement for EDGELINE, METDECK and VMZINC

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The last century can have produced few more iconic designs than that of the £97 million 'Titanic Belfast' building. Opening to coincide with the centenary of the vessel's maiden voyage, the stunning piece of architecture situated adjacent to the slipway from which it was launched in 1911 has been attracting visitors months before the official opening in April 2012. The centre forms the focal point of the Titanic Quarter regeneration which, at 75 acres, is Europe's biggest waterfront development. With funding provided by Belfast City Council, Belfast Harbour Commissioners, the Northern Ireland Tourist Board, Titanic Quarter Limited and the Department of Enterprise, Trade & Investment, 400,000 visitors are expected each year.

The three thousand faceted, three dimensional plates which form the dramatic, angular building's rainscreen system undoubtedly take the eye. Fitted by German façade contractor Metallbau, they are arranged into a complex symmetrical pattern, fracturing the reflected light into an abstract sea of shards. Unseen from the ground, however, the project also has a zinc roofing system fitted by FTMRC members Edgeline Metal Roofing, which will form the first view of the project for thousands of tourists on their flights in to the city.

A compact warm roof, on this occasion specified by Civic Arts / Eric R. Kuhne & Associates and delivered in collaboration with Todd Architects Belfast, involved installation of the VM Zinc Plus® standing seam system in Quartz-Zinc®. Installed over Metdeck composite roofing boards, both systems were supplied by Metal Processors Ltd of Clondalkin. The roof build-up was metal deck, alutrix600 vapour control layer, METDECK158 (158 mm thick warm roof decking board), VM Zinc membrane and VM Quartz plus. The phenolic insulation core of the boards which is factory bonded to 18mm exterior grade plywood has a typical density of 35kg/m³ with a thermal conductivity of 0.02 W/M²K. The VM Zinc Plus system was mechanically fixed but required no underside ventilation through use of a specially developed coating. The self protecting, pre-weathered outer surface will also continue to patinate naturally retaining an 'as installed' appearance without maintenance for years to come, even in such a coastal environment.

Angus Waddington, Associate at Todd Architects added, 'We realised early on that if the Titanic building leaked, the press would have lots of fun. A VM zinc standing seam roof was adopted as a safe choice: low maintenance, time proven and able to achieve the stringent design life criteria included in the brief.' 'The build-up we used was an example of 'value engineering' working- using the expertise of the main contractor Harcourt Construction and the specialist metal roofers Edgeline Metal Roofing.

A number of proposals were reviewed in a series of meetings and reports before the Met-deck and Alutrix600 combination was adopted. We had to achieve the insulation levels needed to meet our BREEAM excellent rating, but our main concern on such a large unventilated construction, was to minimise the number of punctures through the air tightness and vapour barrier. The Met-deck system reduces fixing penetrations while the Alutrix600 vapour barrier offers a degree of 'self-healing'. For similar reasons, we 'designed out' any services penetrations through the roof and adopted a clamped Latchways system (also an Associate Member of the FTMRC);

The roof of the Titanic Quarter provided a particular challenge both in terms of scale and complexity, with the geometric shape and 3-stage stepped profile of each roof requiring innovative solutions to realise the project design. MetDeck was used to simplify the metal roofing application as it provided a continuous fixing substrate – the simplicity of installation greatly reduced labour on site ensuring that the building was watertight within a minimum time frame. The continuous substrate meant that the precise alignment of each run of VM Zinc Plus was not critical and this eliminated the need for re-alignment and associated labour time on site. The design's average U-Value for the roof was 0.18W/m²K, some 18% lower than that required by Technical Booklet Part F2, with some roof sections achieving 0.09W/m²K. At this high performance level, the additional adverse effect of mechanical fixings plays a much bigger part in terms of total heat loss.

The MetDeck solution ensured that fixing penetrations through the high performance insulation core were significantly minimised. Those specifically for fixing the zinc did not penetrate the insulation layer so the designed U-Value was fully

realised across the entire roof. Had it been necessary for fixings to penetrate the insulation layer, the U-Value would have been increased by between 5 and 10% depending on the number of fixings).

19

This would also have introduced a direct thermal bridge, particularly to sections of the roof with an underlying metal deck – potentially leading to localised temperature fall and associated condensation and mould growth. Of course the elimination of these additional fixings also meant that the underlying vapour barrier was not extensively punctured resulting in minimal risk of interstitial condensation within the build-up. The MetDeck system incorporates a high performance bituminous vapour barrier which “selfseals” around fixing penetrations, ensuring minimal adverse effect for the small number of penetrations needed to secure the boards to the deck.

From an interior perspective, the project’s location provides a degree of authenticity and immediacy to which few visitor centres can lay claim. The central atrium has enabled a layout to be developed along the lines of the shipyard itself, adding immediate and dramatic poignancy to the overall experience. As visitors enter, they are taken to turn-of-the-century Belfast and are led down the listed Titanic and

Olympic slipways towards the River Lagan. The experience combines stimulation of the imagination with the unfolding of Titanic’s story from conception, through construction and launch, to its ultimate tragic end.

Over 12,000m² of floor space has been provided across 5 levels to a height roughly equivalent to a 10-storey building. Lower levels have been used to simulate actual depths within the hull with visitors then taking a scissor lift to ascend two levels, passing a huge propeller in a six-minute audio-visual ‘ride’. A sky rail system then uses 12 sixperson pods to create a ‘flying theatre’ which, at a cost of more than £1m, suspends occupants over a huge cinema screen.

When complete, nine galleries will each tell a different part of the story, brought up to the present with live links to contemporary undersea exploration as parts of the hull are explored for the first time in detail. At such a size, the Titanic Belfast was always destined to attract a high profile and make a lasting, local impact. The disaster that claimed more than 1,500 lives led, for decades, to a reluctance to use the ship in a way that might have a positive impact on the Northern Irish economy. At long last, the project and the ship’s construction are rightly being seen as aspects of local pride.