Forum 2020

A NEW ISOTHERMAL SYSTEM WHICH AVOIDS THE COLD BRIDGE BETWEEN THE EXTERNAL AND INTERNAL GLAZING

(A SOLUTION SPECIFICALLY DESIGNED FOR EXTREME WEATHER CONDITIONS)

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60 Degrees North, in the same latitude as Alaska, in the middle of the North Sea and the Atlantic Ocean, the Shetland Islands are one of the wettest and windiest parts of Europe. Constant driving salt water sea spray and 70 mph winds, provides a hostile environment for flora, fauna, people, and stained glass.

In Lerwick Town Hall there is a beautiful, unique, complete set of 19th century stained glass windows by Ballantine of Edinburgh, and Cox Buckley & Co of London. They visually tell the history of the Shetland Islands, and of its Hanseatic past. The windows are almost unparalleled in British Town Halls, as a decorative narrative, and have accordingly been upgraded by Historic Scotland to its highest "A" listing.

In 2012, Rob MacInnes and Linda Cannon (Cannon-MacInnes) were instructed by Shetland Islands Council to restore and protect this historic glass.

The existing secondary polycarbonate glazing, and synthetic butyl-mastic bedding compound, which had been installed in the late 1990's, had completely failed, and was contributing to extreme wind-vortex conditions within the glazing interspace. Constant flexing, caused by the vortex, was causing lead-fatigue, and multiple cracks were appearing throughout the glass and the lead. The surrounding stonework, which had also been replaced at the same time, was suffering badly from salt corrosion and driving rain, resulting in a hollow, honeycomb interior.

Traditional isothermal systems which we studied are robust. However, their use of a cold-bridge system of heavy nuts and bolts and solid framework was rejected by both the architect and the funding bodies. We were required to design a bespoke isothermal system for Shetland's extreme weather, whilst being uncompromising in the aesthetic appearance of the building, both inside and out. The system is designed to be adjusted to provide optimum ventilation for each interspace.

After six years of research and development, using German and Scottish precision engineering, and two years since installation, we would like to present our patented system to the CVMA.

We would like to thank Professor Joost Caen and Leonie Seliger for their assistance with the design and technical specifications.