

Sustainable Innovation: Development and Fabrication of Recycled Glass Shingles for Redruth Buttermarket Restoration

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In Redruth, Cornwall, the Buttermarket is undergoing a remarkable transformation. This Grade II listed building is being adorned with eight hundred handmade shingles crafted from recycled glass. The project, nearing completion, is set to officially open in October 2024. Oseng-Rees Reflection has already transformed 1.5 tonnes of waste glass into functional art. Each shingle, created from recycled material, stands as a testament to the art of recycling and the commitment to sustainable craftsmanship, embodying the principles of the circular economy and innovation.

Redruth Buttermarket: A Revival of History and Sustainability

The Buttermarket complex in Redruth, Cornwall, stands as a beacon of adaptive reuse and sustainable innovation. Initially a dilapidated cluster of buildings, the site has undergone a remarkable transformation spearheaded by Redruth Revival CIC. Formed in 2014 by local businesspeople, the group aimed to rejuvenate the high street and breathe new life into the heart of Redruth. By 2017, they had raised the necessary funds to purchase the Buttermarket site, with additional support from the National Lottery Heritage Fund, Historic England, and the Architectural Heritage Fund. Now the Grade II listed building has been sensitively restored, refurbished, and repurposed, prioritizing the sympathetic upgrading of historic features while enhancing accessibility and environmental impact.

Thread: Innovating with Contextual Design

Thread, the dynamic team behind this project, is committed to delivering contextual, cutting-edge designs. Thread was appointed in 2020 as Lead Architect for the Regeneration of the Redruth Buttermarket Cluster in Cornwall by Redruth Revival CIC. Thread has been instrumental in merging historical preservation with cutting-edge design. Their initial historic research informed the design development, ensuring a thoughtful response to the client's needs and site constraints. One of the most striking features of their design is the innovative use of recycled glass shingles, specified from Oseng-Rees Reflection Ltd, for the external cladding at the iconic courtyard.

In collaboration with Oseng-Rees Reflection, this project demonstrates how recycled materials can be repurposed effectively, providing an excellent choice for those who value both aesthetics and environmental responsibility. The Buttermarket in Redruth is poised to become a beacon of sustainable innovation, showcasing the potential for traditional spaces to be revitalized with modern, eco-friendly solutions.

"We specified recycled Oseng-Rees' glass for a distinctive shingle facade, supporting sustainable practices and local craftspeople while allowing the client to showcase their ethos through the building fabric. We are particularly happy with the outcome of how naturally the recycled glass sits next to the slate shingles, and that this innovative material integrates with the aesthetic of the historic buildings," says Architect Jen Boddington, Thread Ltd.

The Project

This ambitious initiative seamlessly integrates aesthetic preservation with modern technology to enhance functionality and sustainability. Overcoming significant challenges during both the pre-contract phase and fabrication process, Oseng-Rees Reflection successfully transformed waste glass into durable, functional art. Extensive product development and material testing were conducted to evaluate the need for lamination and ensure the material's acceptance. During mock-up testing, it was found that the fused recycled glass exceeded the strength of laminated float glass, making lamination unnecessary. Complementary material tests supported these findings, and building control approved the installation of the glass tiles without additional lamination.

Given that fused recycled glass had never been used for outdoor applications, rigorous testing was essential. This included freeze-thaw cycles, heat and humidity resistance, impact tests, and flexural bending assessments. Following these comprehensive evaluations, the contract to produce 800 shingles was awarded, marking a significant milestone in the project.

Craftsmanship and Technology

When the contract was awarded, Oseng-Rees Reflection, based in Wales, engaged several local pubs and restaurants to collect over 1.5 tonnes of glass bottles. Over six months, these bottles were meticulously cleaned, crushed, and prepared by hand to create the stock needed for the shingles. The raw glass was then formed into large panels using a low fusion temperature technique at the Oseng-Rees studio. Each recycled glass panels have been precision cut into tiles using water-jet technology, and meticulous care has been taken to coat each shingle with a water and dirt repellent layer, providing protection against the elements and ensuring longevity. This hydrophobic coating is another testament to the innovative approach taken in this project, repelling water and maintaining the Buttermarket's pristine condition, regardless of weather conditions.

Looking Forward

As the Buttermarket prepares to unveil its new facade, the project stands as a symbol of Redruth's revival. It merges historical preservation with innovative sustainability practices, showcasing how traditional craftsmanship can harmoniously coexist with modern technology. This project is not just about preserving history; it is about safeguarding our planet for future generations.

Jen Boddington, a key member of the Thread team, expressed satisfaction with how seamlessly the recycled glass integrates with the traditional slate shingles. This fusion of old and new materials not only supports sustainable practices but also aligns with the project's ethos of environmental responsibility and local craftsmanship.

Redruth Revival commented: *'We have worked with our design team at Thread to commission striking new features that align with our principles of reuse and environmental and architectural sensitivity but add a bold modern element to our site. The design featuring Oseng-Rees Reflection Ltd glass tiles is one of the outstanding design additions that we believe contribute to making the Buttermarket a fine example of sensitive but creative restoration of a historic building using the best of innovative modern technology.'*

Tamsin Spargo, Director, Redruth Revival CIC



Figure 1, Jen Boddington, Architectural Thread Ltd.



Figure 2, Recycled glass integrates with the traditional slate shingles



Figure 3, Buttermarket prepares to unveil its new façade, recycled glass installed at the historic courtyard