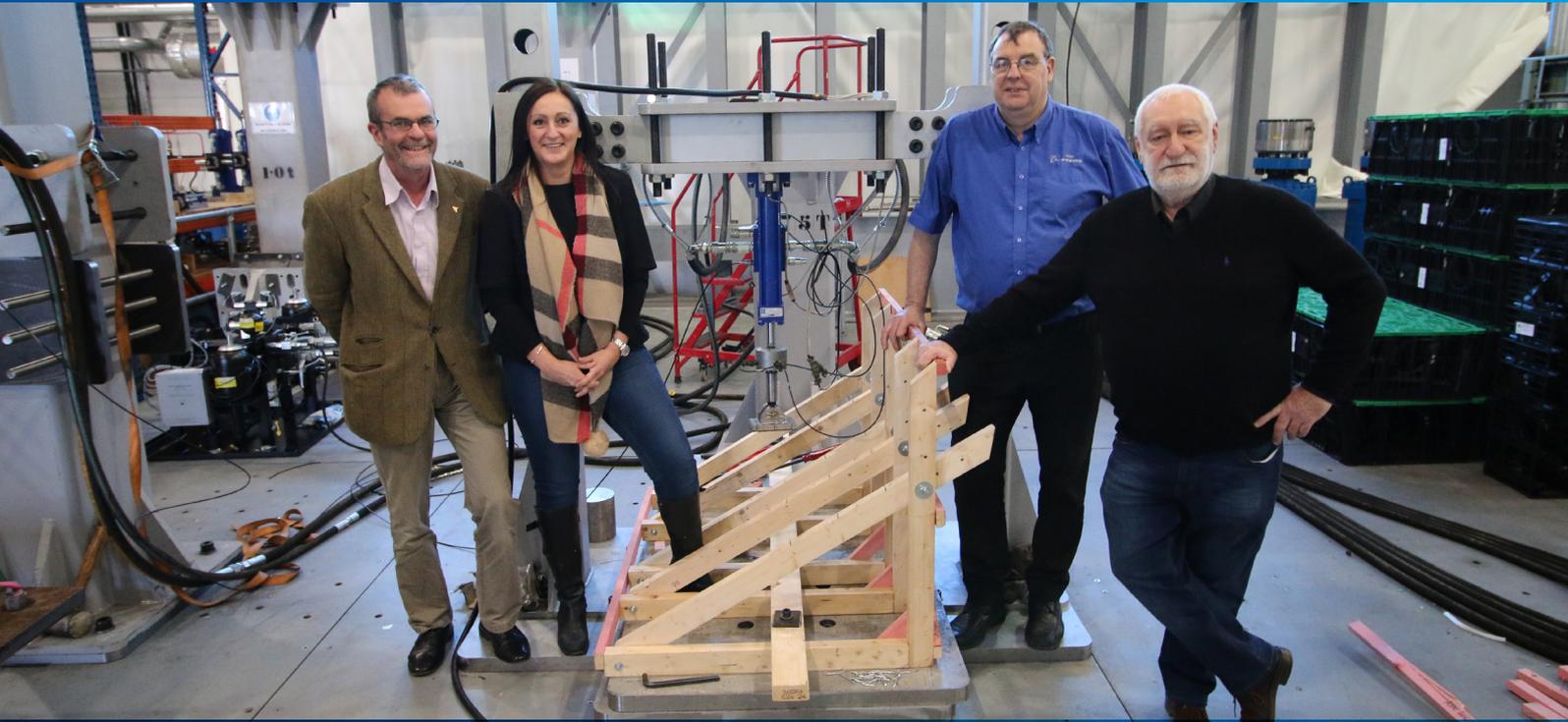


Yorkshire entrepreneur raising the roof with new construction aid tested by AMRC



L-R: Head of the ASTC at the AMRC, Phil Spiers, KEAH General Manager Emma Johnson, AMRC Technical Lead for Structural Testing Shane Smith and KEAH Director Ken Johnson with the KEAH roofing structure installed for testing in the Tall Rig at the AMRC.

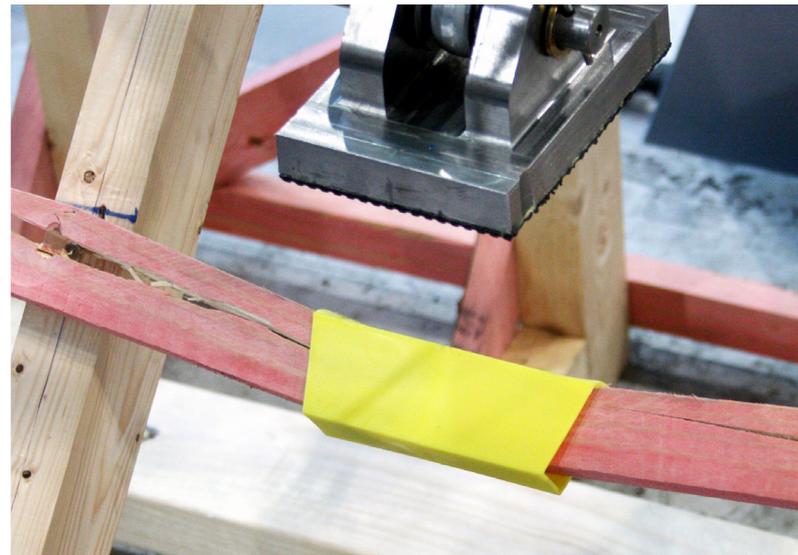
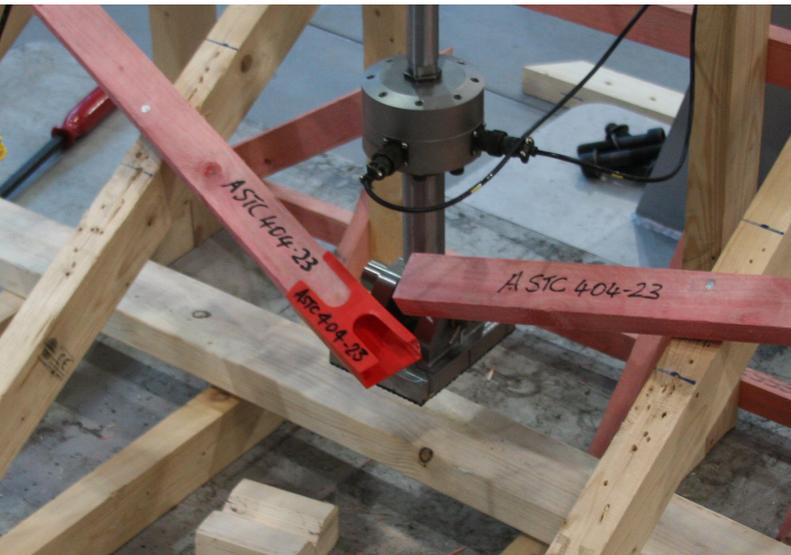
A retired builder-turned-entrepreneur turned to the experts at the Advanced Structural Testing Centre (ASTC) at the University of Sheffield Advanced Manufacturing Research Centre (AMRC) to test and verify his roof batten joints invention.

Former builder and construction industry developer Ken Johnson set up KEAH to bring his innovative ideas - developed from a wealth of experience working on building sites - to fruition and improve construction processes.

KEAH designed and developed the Roof Batten Joint, a plastic injection-moulded, push-fit 'joint' to easily connect horizontal wooden roof battens at any point along a roof structure, instead of needing to saw them to size and nail them to the vertical roofing spars.

The idea is it can join two roof battens at any point on the roof to save time and material waste. This makes felting and lathing a roof quicker, but also safer as it eliminates weakening of the roof structure from trimming and patching battens that can lead to split batten ends and joint failure.

In order to take the product to market, KEAH turned to the ASTC to carry out tests, taking advantage of the UKAS accredited facility's leading expertise in creating bespoke testing systems and procedures.



A team at the ASTC was asked to establish the comparative strengths between KEAH’s push-fit joint method and the more traditional technique of trimming battens to length to construct a half joint above the main roof truss. The company’s ability to interest buyers depended on being able to prove the roof batten joints’ greater load-bearing capacity.

The ASTC tested the batten joints to destruction using a bespoke testing technique. This included strength testing 28 configurations of the batten joints using a Moog control system and the ASTC’s own ‘Tall Rig’.

Two products were evaluated – a red joiner for 48mm x 25mm battens and a yellow joiner for 35mm x 25mm battens. The aim was to prove that using the joining system did not have significant impact on the strength of the batten which, although not a structural roof member, is required to support the weight of a roofer as they attach roof tiles to the battens.

Each product was tested in three ways: a baseline test of the strength of a length of standard batten; a batten joined centrally between 600mm spaced roof trusses; and a batten joined by half-lap at one end of the 600mm span. This was done in both wet and dry conditions.

KEAH constructed a roofing model that fitted perfectly into the ASTC’s Tall Rig – a piece of kit developed with Sheffield-based Gripple UK which has the capability to conduct longer and more accurate tests for a variety of purposes.

Loads were applied to the KEAH joints using the rig until failure of the roof batten. The mode of failure and the maximum load achieved just prior to failure was then noted. This showed that compared with the traditional joint, the KEAH batten joints were capable of carrying an extra ten stones on average.

“Our tests have so far shown that the joints are stronger than traditional nailed roof batten fixtures and experience lower rates of failure. We have validated that the optimum load weight for use is 20 stones, but the joints can support all the way up to 50 stones in weight.” Phil Spiers, Head of the ASTC.

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