STBA

SUSTAINABLE TRADITIONAL
BUILDINGS ALLIANCE

STBA TEIF Project Update - Autumn 2021

The BEIS funded TEIF project run by the STBA has entered and interesting moment. We are working with Rhondda Housing Association (RHA) on two properties in the SW Valleys. Both are voids and this has allowed us to be slightly more ambitious than we were originally allowed with tenanted properties with Melin Homes.

The work undertaken has been based on a Whole House survey by the STBA combined with the standard RHA void schedule of works. In Ton Pentre this amounted to installing IWI using an innovative wet insulating lime and aerogel based plaster system and Diathonite.

To our surprise the front wall of the property turned out to be a block cavity! So the planned use of the aerogel plaster and lime render to the west facing front wall (along with the associated interstitial hydrothermal monitoring equipment) had to be changed to the rear east facing wall. The front wall therefore had the Diathonite IWI applied and the existing external cement render was left intact so as not to damage the blocks.

Blockwork to the front wall. Note the internal wall taken back to allow for continuous application of the IWI.

The wall monitoring is now a little more focused on the thermal performance of the systems as the rear wall faces east. The application of the lime render system also changed focus a little as its main priority now was to see whether it could dry as quickly as promised.

The supplier of the render came to site and spent several days with the RHA contractors (PBM Limited) looking both at application and performance. The process involved getting the PBM plasterers to try different techniques. The team from the valleys and Carmarthenshire harled the render on by hand, used a screw pump and spray and also a cheap mortar sprayer from an airline.

We found that the airline mortar sprayer was more than adequate once the mix of the render had been adjusted to provide a suitable consistency. This indicates that spraying this mortar on is possible even with small jobs like this one. The contractors took a little time in getting used to the equipment but ultimately found it easy to use.

The rationale behind harling / spraying the render on is that it sticks better. Failure in adhesion is a major issue with all renders and so having a simple, cheap and effective way of harling / spraying mortars on is really key to ensuring a high-quality piece of work.

Mixing the render from its dry delivery form was a case of just adding water and mixing thoroughly.

The timescale for the work was:

1. Thursday 9th Sept – dubbing out
2. Wednesday 15th Sept – scratch coat
3. Thursday 16th Sept – Second coat and Tyrolian Finish
4. Friday 17th Sept – Limewash applied

The delay between the dubbing out and first coat was due to the weekend, prior works for the contractor and poor weather. It was felt that the process could have been completed in three consecutive days if other factors had not intervened.

Lime rendering completed in three days. Note: The use of window protectors to minimise potential damage and reduce cleaning times during the application process; The Tyrolian finish was decided on as it gives a higher surface area for any moisture to evaporate from; Window reveals shaped to give a rounded edge; Drip detail retained on window sill; Scaffold set back to provide room for spray equipment.

The IWI plaster was equally easy to use, but it did take a little playing to get the right consistency. Once a workable formula was found for the plasterer the application was quick and easy. To get a consistent depth of IWI it was found that sticking a plastering scarifier through the plaster was the best tool for an uneven wall.

IWI is placed interfloor as well as on the visible walls to create a continuous layer of insulation. Note the use of mesh on the header and some dubbing out around the reveal.

The removal of the cement and gypsum based internal plaster created massive gaps around the windows and door, so much so that the door had to be replaced due to the 7cm gap between wall and frame. Original splayed windows had been squared off (there were chucks of cement around 8-10cm deep removed) and doors and windows gradually become smaller over time due to fitting practices and the gaps just get filled up with cement. So these areas (which are most prone to thermal bridging) actually ended up with some of the thickest layers of IWI. The IWI could be applied up to around 10cm deep in one coat, but we were aiming for around 2.5-3cm to reach the 0.7U value agreed.

We agreed to use a plastic mesh across the wall, although one wasn't needed by the specification, as it was a kitchen environment in a rented house. This was pressed into the first 15mm coat with a 10-15mm second coat. The IWI felt spongy at first but this should slowly become hard. The final coat was a conventional lime plaster at 5mm. This will then be painted using a breathable and scrubbable paint.

The monitoring equipment was installed prior to all the works and is set to be commissioned now that the electrics on site have been re-wired. This will provide the project with the data required to see the effectiveness of both the render and the plaster.

Monitoring by Archimetrics in situ ready to be plastered and rendered over.

Of course, this is a whole house retrofit and so there are other works going on too. We have focused on the external and internal finishes and insulation as this is the element funded by the BEIS grant. However, other works to the property will include:

1.New kitchen

2.New ventilation (dMEV)

3.New bathroom with anti-scold taps

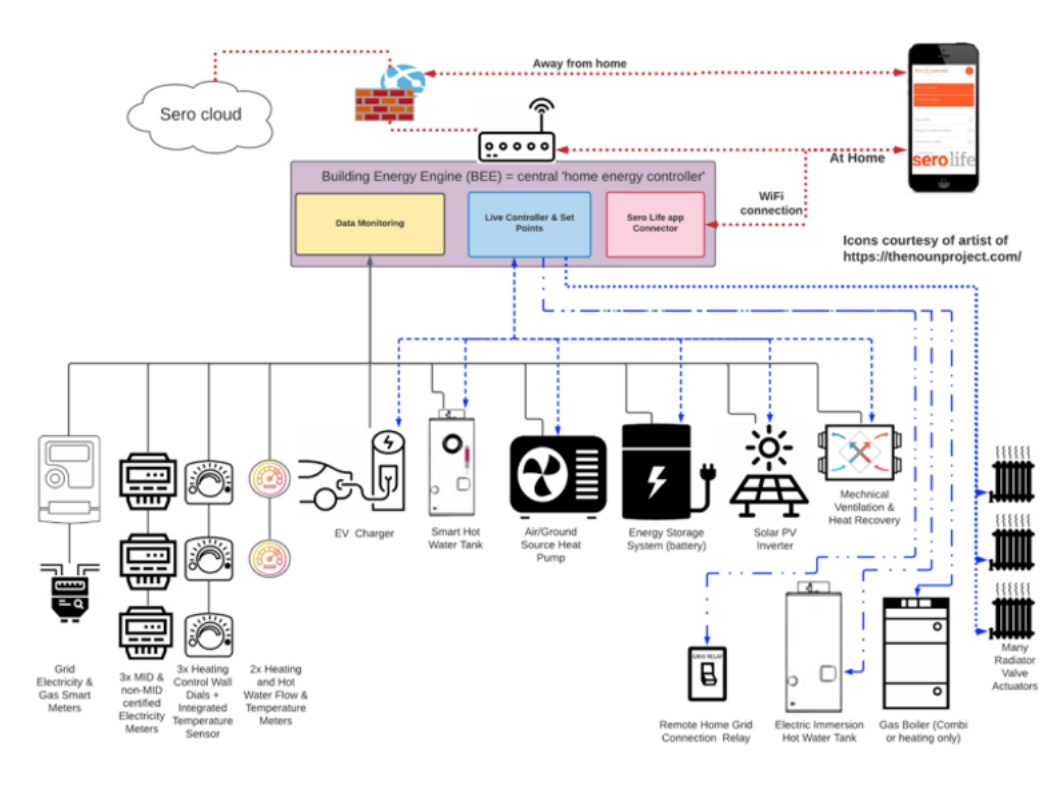
4.Repaired roof

5.Enhanced loft insulation

6.Re-wire

7.Battery storage (to be confirmed)

The property has been included into the Welsh Government's Optimised Retrofit Programme and hence has had a Building Energy Engine (BEE) from Sero Life installed. This will give data on actual electricity, water and heating use as well as internal metrics like IAQ, temperature and humidity. The typical monitoring associated with the original TEIF bid was not possible to install due to a lack of Sigfox signal in the town.



Diagrammatic of Sero's Building Energy Engine (courtesy of Sero)

Even though there is a systemic mistrust of the EPC by the STBA when it comes to individual houses it is projected that this property will attain an A rating, which for a late Victorian terrace in still quite impressive, if flawed.

As a footnote it is encouraging to see that, due to this project, development of an external aerogel render that is quick drying is underway.

October 2021