

Case Study

External Wall Insulation, Leys Avenue

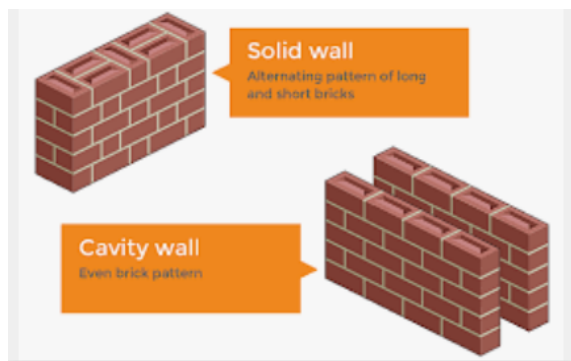
Installing External Wall Insulation on a Solid Wall 1920s Semi- Detached House

People have asked about the external wall insulation I had installed recently. This is a summary of my experiences although there is the caveat that I have no particular expertise in this.

Why wall insulation?

Most, if not all, the original houses on the estate built before 1930 have solid walls, see Diagram 1 below. As you can see the solid walls look like a mixture of longer and shorter bricks so it is easy to identify them. With modern cavity walls the bricks all look like they are the same size. The lack of an air-gap means that solid walls have poor insulation, about the same as double glazing.

Diagram 1 – Solid and cavity walls



Why did we decide to add wall insulation?

There were a number of reasons

1. It can be a struggle to heat the house when it is really cold, at least not without lighting the fire. Other people on the estate suggested wall insulation would help.
2. The energy rating of the house was band E so we were in danger of getting behind the curve. From 2030 it will be necessary to be band C to rent a house, which gives some idea how things are going. The wall insulation should take it to D and with a few other things it might get it to scrape to C. We would rather try and keep the house up to date rather than leave it and end up with a massive bill sometime.
3. The government was offering a grant of up to £5,000 for insulation. This has now finished, sadly.
4. The wood work and masonry needed repainting anyway.
5. In theory, it seemed financially worthwhile. We spend about £750 a year on space heating. People in Mulberry are pretty shocked by this! General estimates suggest we might save [£250](#) a year although we don't know yet. The cost was £9,000, but we got £5,000 from the government and we saved about £2,000 on re-painting. That's a return of 8%, which is quite good, and will be better as gas prices go up. If you had to pay the full cost the return would be 2.7%. This not so good, although you would break even if you could borrow the money cheaply enough.
6. It is good to reduce carbon emissions, particularly if it is fairly pain free. This is estimated to save 1,120kg of CO2 per year.
7. Solid wall insulation is necessary, but not sufficient, to use heat pumps.

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What are the options for wall insulation?

There are 2 options for solid walls, external and internal. These are fairly self-explanatory and there are [pros and cons](#). We opted for external insulation as we did not have room for internal insulation in places like the bathroom and we did not want to lose internal space. Also, the outside of the house needed re-doing anyway. The advantages of external insulation are:

- The insulation is better.
- It is less disruptive inside and it is not necessary to do a major internal re-decoration.
- There is no loss of internal space
- It is better for insulation against heat

The advantages of internal are:

- It is Generally cheaper.
- It does not impact the external appearance of the house.
- Re-decoration is not an issue if you are re-decorating or renovating anyway.

What about cavity wall insulation?

[Cavity wall](#) insulation works by having insulation foam pumped into the cavity in the wall. As you would expect, this isn't an option with solid walls which don't have a cavity. However, it is very cost effective if you do have cavity walls, such as in Mulberry Close. For a terraced house the cost is estimated as about £400 with an annual saving for £100 a year so there is a payback in 4 years.

How was the installation organised?

I had the company called Saving Energy lined up. When the grants came out they did the quote and I applied online for the grant using the quote. Unfortunately, the company dealing with the grants were hopeless and took about 6 months to process this. By then I had lost my place in the queue to start the work in November and didn't get going until April. By then the company were dealing with lots of grant work and the work took months rather than weeks. However, I blame the government for this rather than the company.

There was a government deadline for completing the work. At one point it looked like we would miss this because of the initial delays. We needed the CEO of the building firm to take this up with the government to resolve this and explain that we were late because of the government.

You need to have the 25 year guarantee with the SWIGA, the Solid Wall Installation Guarantee Agency. I imagine you would have problems selling the house without this. However, it is just a fallback if the builder goes out of business. There is no actual independent quality control of the installation so you are still very dependent on the builders doing a good job.,

I wanted to re-paint the woodwork using the scaffolding and the company were happy to allow this.

What were the decisions to make about the installation?

The first decision was to decide how much of the walls to cover. In our case, we decided to do the front and the side wall. Almost all of the rear wasn't solid wall as it was covered by various extensions. If we had completely covered in the lean-to then that part would not have needed insulation. This would have saved money. We took the view we might as well do the lean-to as well. Some people just do parts of the house, say where rooms are cold or on the most exposed wall and there is an argument for that. There can be problems with the guarantee if only doing half a wall though.

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Obviously, you need to consider whether you are going to do any extensions or changes to the house in the future which could impact on the insulation.

Another decision is how thick the insulation should be. The range is from 50mm to 200mm. We went with 90mm which is probably the most common. There is an argument for 200mm, but the downside is that it can look cumbersome and you can get problems opening the windows.

100mm gives you a u-value of [.35](#), about the same as for new build in 2002. 200mm gives you a u-value of .18 which is better than the current new build u-value of .30. You need to work out what is best for your particular house. Either is a big improvement on the solid wall u-value of 2.1.

What about the appearance of the house?

One of our biggest concerns about the project was the loss of the mock Tudor features, although they can be replaced with imitations. The woodwork under the eaves can be replaced fairly easily, I was quoted £300 for this but decided not to go ahead.

Diagram 2 - Before



Diagram 3 - After



The brickwork can be imitated with a plastic brick like covering. Unfortunately, these seem to be based on cavity wall bricks so look very wrong to me. The other solution is use [brick slips](#) which are slices of

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real bricks. These look authentic but it can be very expensive for a lot of them, maybe running into a cost of thousands of pounds. In the end we decided to see what it looked like without any features added first. As it turned out we think it actually looked smarter with just the insulation, partly because it looked so tatty beforehand. This is obviously very subjective. Painting the fence helped quite a lot as well.

How did the installation work?

The installation is not that complicated, it just has to be done well. The first thing is that all the pipes and electrics are moved outwards about 9 inches so that the insulation can be fixed behind it. These are then put back against the insulation at the end. The main element is the Celotex type insulation which is fixed with plastic fixers. There is then a coating plus some mesh. On top is a plastic render which looks like ordinary render.

Diagram 4 – Installation



Diagram 5 - Cross-section

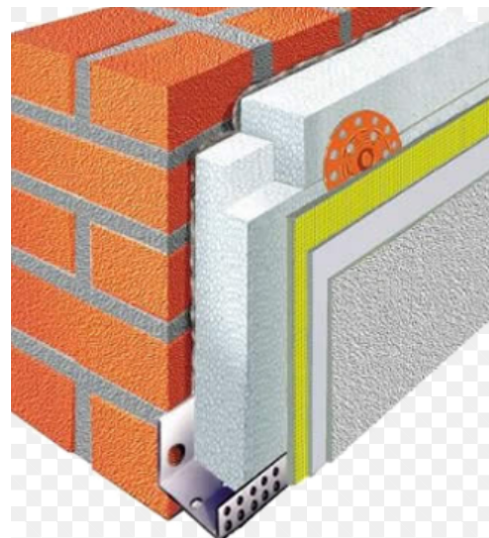


Diagram 6 – Close up of installation



As regard robustness, it has survived the family and bicycles in the lean to so far, but there are probably limits. Bashing it with a full wheelbarrow might be too much. If you want to fix things to the wall, like planters, you can do this with special fixings.

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The builders did a good job but there were a lot of days without progress due to them working on other jobs. Then they would be available but couldn't work because it was raining, or going to rain. Then it stopped raining but they weren't available again.

A problem that occurred was that the boiler flue needed to be longer and they no longer made one for the boiler we had. This meant either a new boiler or leaving a gap around the flue. We went for the later, which does look a bit stupid. Needless to say, the boiler packed up a month later.

Diagram 7 – Boiler flue



Another issue was dealing with the grapevine and the lean-to roof. By the time we had pulled the grapevine away from the wall the brittle lean-to roof kind of disintegrated. The builders did replace it eventually. It took a long time they didn't really have to do it.

What is the overall view of it?

Overall, I am happy with it as I think the house looks a lot smarter, even though that was not the actual objective. I ended up doing more project management than I expected though. Despite these hassles and delays I would recommend Saving Energy from Essex as they knew what they were doing and did a good job. You really don't want something like this to be bodged. They were also generally helpful and friendly.

It is too early to say what the cost savings will be. The upstairs rooms seem warmer but it is rather subjective. With everyone asking me about the project I have realised that I don't have a very good handle on how we use energy so I have had smart meters installed. This should help to see if things like solar panels are worthwhile. We spend more on electricity than gas anyway. I am getting a Hive "smart" thermostat, mainly because the existing one is not working very well.

For others I think a key question is whether there will be any more government grants. If there are, you need to be ready to go straight away as there is always a stampede for free money. It would be worth thinking about it now if you think you might want to do it at some point in the future.