

Details on how I would like to vary the previously agreed conditions

Condition 5: Replace the need for water redirection valves with a natural scheme of rain water management, dMVHR, composting outside toilet for use with the studio.

In order to compensate for not being able to fit these grey water redirection valves to send bath and kitchen waste water to our garden in dry periods, we propose incorporating some other features into the home which contribute to its low impact character and either save energy or water in another way, or contribute to enriching the opportunities for wildlife.

The design of our house with large low windows means it actually will not be hard to siphon water from the bath onto our garden when it is dry, but we will not be able to use the redirection valves which I outlined when I originally discharged conditions.

Our proposed alternatives are:

1) Installing dMVHR, or decentralised mechanical ventilation with heat recovery.

Since the house went up we have noticed its extraordinary energy efficiency, it is very well insulated and almost airtight. It is not passivhaus, but very close. We did not intend to install mechanical ventilation, but we think that it actually may remove the need for a wood burning stove. The dMVHR units we are installing remove air from in the house and replace it with fresh air from outside, and in doing so they recover the heat. They are low power enough to run on our off grid solar PV system, but help to effectively heat the house by retaining all heat generated, meaning that we should be able to keep the house at a steady 18 degrees C throughout the winter without any heating. Electric heating uses a lot of energy, and although we would hope to do it sustainably burning wood is not ideal, so for our home good insulation and not losing heat is the key to keeping it at a habitable temperature in line with our principles. They serve the additional function of controlling moisture, CO2 and VOC levels to maintain a healthy environment. We are including two units to this specification, installed by Ecostream Ltd, and I will include the accompanying documents in support. It is the Prana ERP PRO 160 model: <https://ecostream.org.uk/prana-160-erp-pro/>



Graphic: Ecostream.co.uk

We are fitting one unit in the bathroom and one in the kitchen/main living area of the house.

2) Add a composting toilet to the site instead of second indoor flushing WC

We had initially planned to have a small toilet/shower room upstairs in the house, but we have not done this yet, and it occurs to us now that we are unable to install the grey water redirection valves that we could reduce our water use greatly if we made the second toilet on site a natural composting toilet. Composting toilets do not need water, electricity or drainage, use no chemicals and produce no pollution. Building regulations for indoor composting toilets are more complicated to negotiate so an outdoor one would simplify the process and be a really useful addition to the site. We spend a lot of time outside on site working in the studio and attending to the animals, and we think that a toilet cabin outside would be convenient and useful and save us and our visitors from having to go indoors with muddy boots to use the toilet.

I have looked at the Environment Agency guidance and propose the following details:

- **Location (see map 1)**

We think locating the composting toilet cabin in the garden area, between the hedge shrubs behind the stables would be ideal. I have marked two suitable locations on the map from which we believe we can choose, A and B. Both would place it near to our studio and stables, but also close to the house and garden. There is an outdoor tap close by for handwashing purposes. These suggested locations are also both in an area which is secluded from the road and neighbouring properties, and away from the boundaries of the site. This area is well drained compared to other parts of the site, as we have put French drains around the house, and this area is just downhill from them. This means the path up to it should not get too boggy at times of heavy rainfall. The area is not likely to flood, although we do have persistent puddles in some parts of the field, this area is fairly dry, so even though rainfall has been irregular in recent years we are confident that there is no risk that the unit would be threatened in this way.
- **Design and Function**

Urine has to be separated in an effective composting system and can either be collected to use as fertiliser or directed into the ground via a soakaway if it is less than 10 litres per day, which it certainly will be. An attachment is used to separate the urine in this way. The solid waste is mixed with sawdust and stays in the unit for up to a year before the container is switched. The old container is then left in an adjacent compartment in the cabin, or a specially designated secure composting bin, for a further year to compost fully. Wheelie bins are often used for this as they are secure, rodent proof and watertight, and can be moved easily. They are large however so we may opt for something a little smaller, as we don't expect to have a lot of solid waste to compost. Once it is fully composted it can be used as a fertiliser on ornamental plants. We would use it on the hedge trees which run across the middle of our field. Either a clear roof or a high up window will provide light for daytime use. It is not intended for use at night but a solar powered motion sensing security light would work if needed.

Application to vary conditions: eco house at Drummers, Little Bentley Road, January 2024



Example photos: reworkshopwales.co.uk



Example photos: reworkshopwales.co.uk



Urine separator: Free Range Designs

- Possible contamination risk

We have considered the possible risks and downsides of this option and feel that the likelihood of any contamination occurring is very low. Providing the composting toilet is set up and maintained correctly it is a very environmentally friendly solution and will save a lot of fresh water that would otherwise be used for flushing. Firstly, there are only two of us living here so it will not be in heavy use. Secondly, we intend to situate it in a suitably sheltered and appropriate location so that weather conditions cannot compromise it. Thirdly, good design and maintenance should ensure that it functions as planned. In the unlikely event of contamination of the surrounding area with waste, the toilet is located away from ditches and water courses and in the middle of our property, and the quantity of spillage would be very small, so no public or neighbouring areas would be affected.

3) Establishing a wildlife pond to receive rainfall from the house

As we are off grid, all of our waste water is processed by an Ecoflo coco filter system – a tank and filtration system which cleans and releases the water, whilst sludge is emptied every couple of years. This system is not designed to accept water from gutters and storm drains, so although it was not part of our original plans, we have been experimenting with ponds and soakaways to try to manage this run-off water and create a new wildlife friendly feature. The quantity of water is too large for rain barrels and being off grid for power, we do not have the power available to pump it from storage tanks. We decided that a pond could be used instead as a reservoir to water plants in dry periods, if it accepted rain water.

We have experimented with a pond over the last 18 months and believe it is now working as planned and can be made permanent. It is now 8x4m with gently sloping sides. We have found that this is large enough to accommodate the rainfall from the house even in extreme weather without filling to the top. The large quantities of rainwater we have seen recently mean that the pond needs to release water slowly back into the ground to avoid being permanently full to the top, so we have opted to allow it to be lined only with natural clay rather than a rubber lining so far. However if it does dry out I plan to put a natural rubber liner in the bottom to prevent it fully drying out in future. We have an emergency channel for when it is totally full which allows it to overflow to the ditch, but it has never reached this level so far. We have had a lot more flies since we started experimenting with the pond, and it has attracted a lot of birds. We have now planted some trees around it and hope to make it permanent according to the map (see map 1).

Condition 4: Allow for the driveway to be surfaced with an alternative natural material which has similar properties – replacing hoggin with type 1 granite where appropriate

We are now at the point of surfacing the entrance, parking and turning area in order to comply with building regulations. We had previously not produced detailed plans, and had stated that we wished to use hoggin. At the time, this was the most suitable material I could think of, but having taken advice from a contractor I have been told that a natural type 1 granite aggregate will be preferable. This is because it has excellent weight-bearing properties and its behaviour in wet conditions is more stable. As the conditions here are often very wet and natural drainage is poor, I feel that I need to take notice of this advice.

Type 1 granite is a natural product which allows water to drain through it, and compacts to a bound surface that will not send loose chippings onto the public road. I think that it may be sensible to use this product at least where large vehicles may require access.

The driveway specification is as follows in compliance with building regulations, and is shown on the map (see map 1):

- The parking area would be 15mx14.5m
- The turning spur coming off the parking area would be 15mx3.7m
- The parking area designates 2 parking spaces each 2.9x5.5m
- With 2 cars parked there is still space for a large vehicle to get within 45m of all indoor parts of the house, and turn around to exit the site.
- There is a path to the house which is minimum 900mm wide and allows step free access to the house
- All these areas of hard standing are to be bound with timber and surfaced with type 1 granite or hoggin. This would be landscaped in around the edges so hard-standing is flush with ground level.
- There are no close trees/fences or other obstacles butting up to the edges of this parking area or the turning spur, just grass.
- The gate is more than 6m from the public road with 45 degree visibility splays as specified