Background to the reasons for requesting a change / variation to original planning conditions

When the original proposal and application was considered there were some unknown site conditions that have since been discovered as the development progressed. This led to a review of the methodology proposed for providing the heat and power requirements of the property versus that requested in the planning consent. This consequential change has affected, in part, both conditions 11 and 12 hence a variation to these conditions is requested.

The site has shown that underground storage for the heating demands is not a viable option. Pages 8 & 9 on the attached report show that the soil directly beneath the building is chalk beyond a depth of about 1m. On previous projects, the earth energy bank begins at about 800mm below the finish floor level and extends a further 1.5m into the ground. This would place the majority of the infrastructure within chalk.

Chalk is an insulator which means the earth energy bank would not function properly if installed beneath Pippin Barn. We could not have known this until the soil investigation was undertaken which occurred post-planning.

Other alternative technologies such as Gas, Oil, LPG or Logs were not viable options either because Gas, at the time the decision was taken, was due to be phased out in 2025. Oil, being a fossil derivative is not considered environmentally friendly nor sustainable. LPG being considered as a more friendly energy source would require a larger infrastructure and does not provide a free energy source as does solar. Whilst logs can be derived from sustainable sources it is now considered as a potentially harmful particulate polluter if the log burners are not maintained properly. Log burners can also create a less than desirable atmosphere inside any building. The energy efficiency of the building has shown the building would overheat when using this source of heating thus it would have limited use.

Following on from this approach the architects introduced an Infra Red heating system to replace the proposed methodology as meeting the key objectives requested in the planning approval: Thus maintaining the spirit of the condition and at the same time improving upon the technologies that can be employed.

In 2019, the UK government initiated the Future Homes Standard. The aim was to incorporate energy efficient technology into all new build homes. This ‘future proofing’ will see an average home produce 75 – 80% less carbon emissions than a property built to current Part L standards. Low carbon heating systems are at the heart of these new regulations and will be an integral part of the house building industry in the next decade and beyond.

Far infra-red heating systems is the perfect solution for meeting the Future Homes initiative. When combined with renewable sources of energy such as solar panels and wind turbines, it meets all the government requirements for new-build homes.

With electricity being the only other viable option and was part of the original planning application for its power requirements a method of producing the heating needed to be found that was both viable, sustainable and efficient. Combined with significant embodied energy savings and running costs and maintenance savings that utilises around 35% of the energy by using a radiant form of heating especially when compared to convection based heating systems such as had been proposed originally, this form of heating to replace the original proposal meets and exceeds the criteria demanded.

To achieve this section 9.2.6 has been affected by removing the
- PV-T panels
- Earth Bank Inter Seasonal Storage
- Phase Change Thermal Store
- Recreational Log Stove
- Aquamaster Inverter Heat Pump

The MVHR heat recovery remains employed internally.

Section 9.2.7 changes to use PV panels instead of PV-T otherwise everything mentioned in this section has been adopted. The PV panels have since been upgraded to 440W devices which has increased the power generation on the property. They also use enhanced inverter technology at the source to reduce losses when feeding power along the cables.

Current Position

Condition 11

This considers the energy efficiency and requires the building to be constructed to an exceptionally high standard of energy efficiency far in excess of Building Regulations Part L minimum standards. The building **has been** constructed within the parameters set out in section 9.2.2, Fabric First Approach, achieving an air permeability of 1.5m3@50Pa together with an EPC 'A' rating with a score of 93. This is reflected in the as built SAP compliance report certification.

11. Prior to first occupation of the dwelling, an Energy Performance Certificate (EPC) rating of "A" with a SAP (Standard Assessment Procedure) score in excess of 100 must be achieved; building fabric efficiency of floor, roof, walls, and windows to be constructed to no less than the U-values set out in the application document page 9.2.2 (Rule 1: Fabric First Approach) of the Architectural and Landscape Design Proposals document (November 2018); and an air permeability result no greater than 2m3/h.m2@50Pa. to be achieved. Certificates confirming these results shall be submitted to and approved in writing by the Local Planning Authority.
Reason: To ensure that the dwelling is constructed to an exceptionally high standard of energy efficiency, far in excess of the Building Regulations Part L minimum requirements.

The property could have exceeded the score of 100 however due to factors beyond all of our control it has not met the criteria of a SAP score of 100. This has **not** arisen because the fabric of the building did not meet the conditions outlined in the proposal or the planning condition.

This has arisen as a result of the government calculators, seeing electric energy as the main energy source, currently consider and rate this source of energy as very poor. At the time of writing, they, the calculators, do not factor in low energy electric heat sources. To achieve the score of above 100 a wind turbine was suggested which would have additional structural impact which we believe, the costs versus return, would not make this viable *or* the calculators need to allow for the newer technologies such as Infra Red Heat Sources. Increasing the quantity of solar panels would help but would not get to the required score laid down unless significantly increased in number for which there is limited capacity for because structurally the building has not been designed to incorporate more loadings.

Currently this presents a 'catch22' scenario as it is unlikely this change to reflect modern practices as demanded by the Future Homes Standards is to be implemented any time soon.

Condition 12

This considers the heat and power demands of the building and requires the technologies employed intrinsically and inextricably linked, amounting to the highest standard of architecture

12. The heat and power demands of the dwelling shall be met through the use of technologies as proposed in the application documentation pages 9.2.6, 9.2.7 and 9.2.8 of the Architectural and Landscape Design Proposals document (November 2018), full details of which shall be submitted to and approved in writing by the Local Planning Authority. All systems are to be fully functional prior to full occupation of the dwelling. Any subsequent development or alteration of the approved technologies providing the heat and power demand of the dwelling shall be submitted to and approved in writing by the Local Planning Authority prior to their implementation.
Reason: To ensure that the technologies relating to heat and power employed in the design that are an intrinsic component of the dwelling's highest standard of architecture are first implemented, retained thereafter and capable of advancement throughout the lifetime of the development.

The method for powering the property has **not** been in anyway altered other than to upgrade the capacity.

The method for heating the property proposed in section 9.2.6 (and by default parts of 9.2.8) is the main change to the original proposal and the heating system to be employed has been chosen in order to fulfil the spirit of the condition and to move forward in terms of technological changes that were largely unheard of in the UK but has been employed in Europe for many years. Hence it is not simply an unproven but a proven technology that is new to the domestic UK marketplace.

By adopting the use of an infra red system to heat the property it also brings with it a number of benefits not previously considered in the proposal. It creates a more environmentally friendly and sustainable approach to providing the demands of the development both now and in the future.

The main benefits are :

- Reduction on the impact to the environment and the site by removing the use of chemicals necessary for the storage of solar generated power throughout the summer months,
- Reducing the power demands upon both the grid and PV supplies by using a low voltage energy heat source
- Removing the need for high energy electric pumps to drive the system through the system
- Removing the need for a water based heating system throughout the house
- Removing the requirement for a recreational stove mitigating the need for a log store and use of wood burning, now considered environmentally unfriendly if not maintained correctly.
- Utilising a direct heat source as opposed to an indirect method and uses internal mass as a thermal store to release its energy back into the surrounding areas.
- Removing a large amount of additional infrastructure and hardware
- Producing a cleaner atmosphere within the property
- Using mass within the property to act as an accumulator
- No external noise generating devices such as Air Source Heat Pump fans etc
- No maintenance requirements on going
- A long lifetime product with low carbon footprint
- It does not have any impact on anyone externally, either visually nor audibly, ensuring a quiet and peaceful coexistence with the technology for the occupants.

This use of a modern technology with the benefits it brings not only meets the condition but exceeds it in such a manner that the original proposal could not hope to achieve. In other words it has significantly enhanced the application.

Here is a link to more detailed information from the supplier / manufacturer https://www.energycarbon.co.uk/ A consumer market product leader for example is Herschel where they build it into panels and mirrors etc.https://www.herschel-infrared.co.uk/

I have attached the manufacturers brochure which gives more information if required for consideration. I have also attached the suppliers specification for the integration of this system which shows the coverage and power requirements. Redundancy has been built in to the calculations to ensure adequate coverage.

Outcome

We request that condition 11 is amended to reflect the lower than expected SAP score due to the calculators inability to acknowledge the low power use of electric source.

We request that condition 12 is amended due to the findings of the on site survey post consent and our need to find an alternative heating source that meets and exceeds the original criteria and reflects the change in technology.

END