

THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS

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Mary Collins  
Senior Planning Officer  
Diocese of Ely

Your ref: 22/03811/FUL  
Our ref: 177495

By email

14th November 2022

Dear Ms Collins,

**King's College, King's College Chapel, King's Parade, Cambridge, Cambridgeshire CB2 1ST  
Installation of photovoltaic panel arrays on the north and south slopes of Kings College Chapel  
and related infrastructure**

Thank you for consulting the SPAB in relation to this application for the installation of photovoltaic panel arrays on the north and south slopes of King's College Chapel.

In examining proposals for listed buildings where the justification is framed primarily in terms of carbon reduction, the SPAB aims for a balanced approach. We recognise and support the need to improve the sustainability of buildings of all ages. Where there are clear and convincing public benefits in terms of sustainability, we accept that a measure of harm may sometimes be justifiable to achieve this. Equally, if an applicant seeks to justify harm to the significance of a designated heritage asset on the basis of sustainability improvements, the public benefits in terms of carbon reduction must be clearly demonstrated.

Any harm in this case would be primarily visual and would flow from the presence of PV arrays on the north and south roof slopes, the roof slopes being partially visible from numerous vantage points on the College estate and surrounding area. We are satisfied that any harm to the building's historic fabric would be minimal, as the lead roof is already to be relaid, and careful consideration has been given to the method of fixing the panels in order to minimise impact. Any harm caused would therefore be primarily to the architectural significance of the Chapel and, to a lesser extent, the other buildings that sit in close proximity to it. We do not propose to deal in detail here with the significance of the Grade I listed Chapel, the international significance of which as an outstanding example of the craftsmanship of the late Perpendicular period is undisputed.

What is a matter of dispute is the extent of harm that would result from the proposals. In this context, we would like to commend the considerable amount of work carried out by the applicant's agents to both minimise the impact of an installation and facilitate assessment of that impact. The panel specification is one that seeks to minimise impact by employing an all-black panel and frame and a panel with low reflectivity. The array has been moved further down the roof slope than originally proposed in order not to obstruct the view of the ridge line (although this has been achieved more successfully on the south slope than the north).

The provision of in situ mock-ups has been helpful and we were able to visit to view these. We concluded that the panels will be slightly visible through the perforations of the parapet, but that this will not be obvious to most taking in a general view of the building. We also noted that, as the panels would cover the whole of the slope, there would be no contrast between lead and PV panel, a factor which may help to reduce the visual impact.

We were, however, struck by the way that the reflective surface of the panels changes as clouds pass overhead, showing as white with cloud cover, and black when the sky cleared. While there has been some debate as to the extent of reflectivity of the panels, this would seem to be primarily around the technical definition of reflectivity. When observed on site, it is beyond doubt that they are reflective of the changing weather conditions overhead, and that

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this gives them a dynamic nature that is very different to the more static and recessive nature of a lead roof. With arrays in place, the roof would become a more prominent feature of the building. We consider that this alteration of the balance of architectural composition would result in a measure of harm to the architectural significance of the building. However, in our view, the level of harm would be less than substantial and may therefore be acceptable if a clear and convincing justification can be provided.

The Society's view, as articulated above, is that an applicant seeking to justify works that involves some harm to the significance of a designated heritage asset on the basis of sustainability improvements must demonstrate that there are clear public benefits in terms of carbon reduction. We have therefore given careful consideration to the information provided by the application in respect of potential carbon reduction. Our casework team has met with the applicant's agents alongside the Society's sustainability expert to discuss this aspect of the application in detail. Our comments in this respect are as follows:

The College clearly has a real desire to act in this area. There is not a great deal of detail in the report on what has been achieved to date, but we are told that a PV array has recently been installed elsewhere on the College estate. The College has commissioned a detailed report by building services consultancy Max Fordham, which outlines a number of options for achieving decarbonisation. However, while the application refers to this report as the College's sustainability strategy, it is in fact a set of recommendations, many of which the report assesses as difficult to deliver without substantial harm to the highly listed historic assets that form the greater part of the estate. The scope of change outlined in the report would necessitate very considerable funds to be deployed by the College.

While the Max Fordham report is informative, we can see no evidence in the application or elsewhere that the College has an adopted and funded sustainability strategy. This is a key point as, in order to provide the clear and convincing justification of carbon reduction required, a proposal of this type must form part of a whole building/estate approach articulated in a sustainability policy which sets out the range of measures that will be taken to reduce the carbon footprint. We do recognise that the College has carried out a number of actions in this respect, but evidence is needed of an holistic approach that explains what other actions the College intends to take to reduce carbon emissions. As the church of England's guidance 'A practical path to net zero carbon' [Microsoft Word - the practical path to net zero carbon for churches FINAL numbered October 2020 \(churchofengland.org\)](#) sets out, there are a great many measures that can be taken to reduce carbon emissions that will cause low, or no, harm and that should be adopted before more harmful interventions are contemplated. We think this is particularly important in the current case given that the reduction in emissions that would result from the PV array is calculated by the Max Fordham report as being in the order of only 1.4%. What other measures involving lesser harm does the College intend to take, and what will the comparative impact be? Examples of this type of action might be better draught proofing, using LED lightbulbs, using A+++ appliances, lowering heating temperatures, installing TVRs on radiators, etc.

Output from the combined arrays will considerably exceed the chapel's usage requirements and in fact the Chapel's electricity usage would be more than met by the south array. This calls into question the justification for the north array as well as the requirement for a south array of the extent proposed. While the College has said that that this will be addressed by using the excess electricity for other buildings, it is not clear what the benefit will be or whether this could be achieved in other, less harmful ways. The College has more than one mains electricity connection and it has been suggested that the array will be wired back into the one that serves the Chapel and adjacent buildings. However, a key detail missing from the proposal is a clear profile of the expected generation against the electrical demand through the meter into which the array will be connected. There has been some attempt to estimate expected generation against the chapel usage, and the entire College use, and the reality will be somewhere in between. As the proposed panels' output will far exceed the electricity demand of the chapel itself, the benefit from an array of the size intended will be primarily in supplying the rest of the college estate which uses electricity through the same meter to which the chapel is connected. However, it is not known what measures have been taken to reduce the electricity demand from the 'non-chapel' usage (such as installing LED lighting and the like), nor is it clear what other, less visible, roofs may be viable to generate further electricity for this supply.

The applicant has provided us with data showing the performance and embodied carbon impact of the north and south arrays respectively. This demonstrates that the north side would take 6.4 years to pay back from the electricity generated. However, it is likely that this data only relates to the panels themselves and excludes the support, fixings, cabling and inverters. It is also based on a static view of grid electricity carbon emissions at today's level. The carbon intensity of the grid is expected to fall, and we would be concerned that the north side array could have a carbon payback of over 10 years given these additional considerations. This would mean that the proposal would emit more carbon into the climate between now and 2030, not less.

The calculations presented suggest that the north side array will produce only 60% of the electricity of that of the south side. The north side array also has a higher potential for visual harm in the key view from Trinity Lane as the mock up demonstrates that the top edge of the panels would mask the ridge line. This is due to the more acute angle of sight at the point at which the building first becomes visible from the Lane. The north side array will also be clearly visible when viewed from the tower of the Church of St Mary the Great.

The Chapel is an iconic building of international importance and a destination for many visitors to the city. The justification for any harm must therefore be of the highest standard and the balance in favour of public benefit over harm must be significant and beyond doubt. While we are supportive of the principle of the proposal, for the reasons given above, we do not consider the justification for the harm caused to be sufficiently robust in this case. The benefit of the north side array in particular has not been demonstrated clearly enough. Were the building in question to be less important and prominent then it might be possible to accept a finer balance.

In considering the proposals we have also been mindful of the requirements of the National Planning Policy Framework in respect of the justification required for potential harm (NPPF 196, 199, 200). It is our assessment that the proposals do not currently meet the requirements of the NPPF in this respect.

We hope these comments are helpful in determining the application. We would be pleased to advise further if appropriate.

With best wishes

Christina Emerson  
Head of Casework

cc Oliver Caroe, Caroe Architecture