

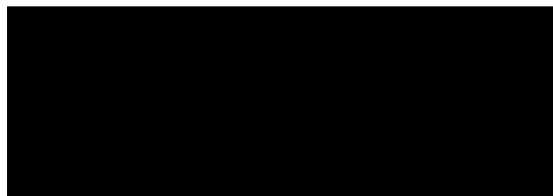
ST CATHERINE'S COLLEGE, OXFORD

REINFORCED AUTOCLAVED AERATED CONCRETE ROOFS
MITIGATION WORKS

TEMPORARY LECTURE THEATRE MARQUEE
TEMPORARY KITCHEN UNITS

HERITAGE STATEMENT
DESIGN & ACCESS STATEMENT

FEBRUARY 2024



All rights in this work are reserved. No part of this work may be reproduced, stored or transmitted in any form or by any means (including without limitation by photocopying or placing on a website) without the prior permission in writing of Pendery Architecture & Heritage Ltd, except in accordance with the provisions of the Copyright, Designs and Patents Act 1988. Applications for permission to reproduce any part of this work should be addressed to d.pendery@btinternet.com

Undertaking any unauthorised act in relation to this work may result in a civil claim for damages and/or criminal prosecution. Any materials used in this work which are subject to third party copyright have been reproduced under licence from the copyright owner except in the case of works of unknown authorship as defined by the Copyright, Designs and Patents Act 1988. Any person wishing to assert rights in relation to works which have been reproduced as works of unknown authorship should contact Pendery Architecture & Heritage Ltd at d.pendery@btinternet.com

Pendery Architecture & Heritage Ltd asserts its moral rights to be identified as the author of this work under the Copyright, Designs and Patents Act 1988.

© Pendery Architecture & Heritage Ltd 2024

CONTENTS

1 Introduction

2 Historical Development And Significance

3 The Need For The Works

4 Temporary Mitigation Works Already Carried Out

5 The Current Proposals

6 The Impact Of The Current Proposals

7 Accessibility

8 Conclusion

1 Introduction

This combined Heritage Statement and Design and Access Statement has been written in support of a planning and listed building consent application for a temporary lecture theatre marquee and temporary kitchen units as part of the mitigation works at St Catherine's College. These have become necessary due to the exceptional circumstances involving reinforced autoclaved aerated concrete (RAAC) roof planks.

Six buildings were built using RAAC roof planks. There are Staircases 1-8, Staircases 9-16, the Bernard Sunley Building, the Wolfson Library, the Dining Hall and the Administration Block, which includes the administration areas, SCR, kitchen, plant room and student facilities including the JCR. All of these buildings are included in the 1993 listing, at grade I.

To mitigate the effects of the updated assessment of RAAC roof planks, some urgent works were undertaken in order that the college could open in time for the start of the new academic year in October 2023. These are included in a planning application (23/02716/FUL) and a listed building consent application (23/02717/LBC), currently being considered by Oxford City Council. These urgent mitigation works are a temporary solution for the primary objectives of making all of the study bedroom areas safe, providing a temporary kitchen and dining area, and some limited social space. However, other than the two residential buildings of Staircases 1-8 and Staircases 9-16 and some areas of the kitchen, all of the other affected buildings- the Bernard Sunley Building, the Wolfson Library, the Dining Hall and the Administration Block- have all been declared to be out of bounds for the most part and cannot be entered without permission.

Now that the initial temporary situation has been established and stabilised, this new application for planning and listed building consent is a partially retrospective application for a temporary marquee for a lecture theatre which is currently being erected on the site and for proposed temporary units for the kitchen, food preparation and storage, which have not yet been brought to the site.

Since this is an application for temporary works, the assessment and impact aspects of the Heritage Statement or the review of the relevant planning policies in this document are not as comprehensive as would normally be the case. This is because due to the necessity of the works in order to keep the college functioning while the permanent solution is developed, the options for locating a temporary lecture theatre marquee and the proposed kitchen units are limited. None of this is ideal and under less exceptional circumstances, the works would not be taking place. Even so, in carrying out these works, consideration has still been given to minimising their impact on the historic building fabric and the landscaping, with all of the works being reversible, as outlined below.

With the new academic year underway, the governing body of St Catherine's College are now working towards the permanent proposals for making the RAAC roofs safe. A planning and listed building consent application for this will be submitted as soon as possible.

2 Historical Development And Significance

The origins of St Catherine's College lay in a Delegacy of 1868 for 'unattached' students unable to pay college fees. The students founded a social club, called St Catharine's from the hall where it met, and further clubs adopted the name in its modern spelling. In 1931 the Delegacy became the St Catherine's Society, which appointed Alan Bullock, then Dean of New College, as its Censor or warden in 1952. He quickly recognised that in the post-war era, when increasing numbers of students had grants but the cost of digs was rising fast, the need was for more accommodation. In April 1956 he proposed a new undergraduate college that would be equally balanced between the sciences and the arts, marking a shift towards science at Oxford. St Catherine's College was formally constituted in 1962.

In 1956 Merton College offered 6 acres of Holywell Great Meadow close to the city centre. By 1959 a 7.9 acre site had been secured, bounded to the west by an arm of the River Cherwell canalised in the seventeenth century to serve a flour mill, with road access only from the north. It was an almost featureless field but the surface level of the land had been raised when Oxford City Council used it as a tip in the late 1930s before adding topsoil. Then in the late 1940s the site was used as allotments. Povel Ahm of the engineers Ove Arup and Partners designed the flat Napper's Bridge leading on to the site in 1960-1.

With the establishment of the new college and a site unencumbered by any existing buildings, there was enthusiasm for the new buildings to be of a modern design. A committee was established to find a suitable architect, aided the University Surveyor, Jack Lankester. After a review of 37 English architects, whose work was considered to be tame and a review of American architects, who were thought to be located too far away, Scandinavian and in particular Danish architects were considered. Denmark's social modernism symbolised the egalitarianism that Bullock stood for in Oxford. In Jacobsen's work, design embraced furniture, light fittings and landscape gardening as well as architecture. This homogeneity appealed to Bullock and the committee members and in February 1959 they proposed that in addition to the new buildings, Jacobsen should design furniture and fittings, and also the landscaping. Bullock provided a schedule for the accommodation required, and had views about the general site layout and the preferred construction materials but the architectural language and design of the buildings, fixtures and fittings and the hard and soft landscaping were left to Jacobsen.

The funding for the accommodation blocks came from the University but sponsorship had to be found for the other buildings, with the lecture theatre delayed until funding was provided by Bernard Sunley. After the main college area was completed, the entrance planting was revised by Jacobsen in November 1968 when the gateway was remodelled. It was adapted again after Jacobsen's death when the Alan Bullock and Mary Sunley buildings were built in 1982-3 by Jack Lankester in homage to Jacobsen's style, with the advice of Jacobsen's assistant, Knud Holscher. Subsequently the college has expanded to the north of Manor Road, with buildings by Stephen Hodder from 1994-5, 2002-5 (including a new lodge) and Purcell, 2018-19, (in part extending Hodder's eastern range of 2002-5). These developments are built from a similar palette of materials as the original buildings and incorporate a long lawn and beech hedges that reflect the character of the earlier gardens.

The significance of the Jacobsen designed buildings, fixtures and fittings and the built landscaping features were recognised when they were listed in March 1993.

The main listing is for the area described as the podium, being the raised area that had been the council tip. This listing covers the dining hall, common room blocks (administration block); two residential blocks (staircases 1-16); library; Bernard Sunley Lecture Theatre; bell tower; piers and covering to walkways to east and west of library and east and west of hall; bridge adjoining west side of podium; brick walls enclosing canal and patio areas on western edge of podium; brick walls to patio areas to eastern edge of podium; twenty five short stretches of garden wall all running east-west, some incorporating seats; paving to podium surface and steps to east and south sides.

There are separate listings from March 1993 for the gym, the music house, the brick retaining wall running north from the music house to the bridge to staircase 14, the Master's lodgings, and the bicycle store. All of these listings are at grade I, with group value.

Outside of the area to the south side of Manor Road, the punt house designed by Jacobsen and built in the north-west corner of the site was also listed in March 1993, at grade II.

The whole area of the college to the south of Manor Road (ie also including the Alan Bullock Building and Mary Sunley Building and the maintenance department and laundry building, all designed by Lankester) was also listed as a historic park and garden at grade I in July 1998. Outside of this area, the punt house designed by Jacobsen and built in the north-west corner of the site was also listed in March 1993, at grade II.

The reasons for such a comprehensive listing at grade I were included in the landscaping listed as being for the following principal reasons:

Historic interest: as a physical manifestation of Arne Jacobsen's comprehensive plan for the college, which was constructed entirely anew in the mid-1960s on an undeveloped site.

Design interest: as a highly unusual and complete integration of architecture and landscape, the whole created on a 3m square grid which unifies the buildings and landscape in scale and planning; the refined design includes buildings and landscape as a single, cohesive entity, with an overall concept in design, colours and materials; the landscape includes garden rooms linking the buildings, walls which extend the buildings' form and materials into the landscape, and elements from the landscape are reflected in the buildings; strongly influenced by garden design in his native Denmark, the apparently simple, rational layout of Jacobsen's landscape demonstrates real quality in design and execution.

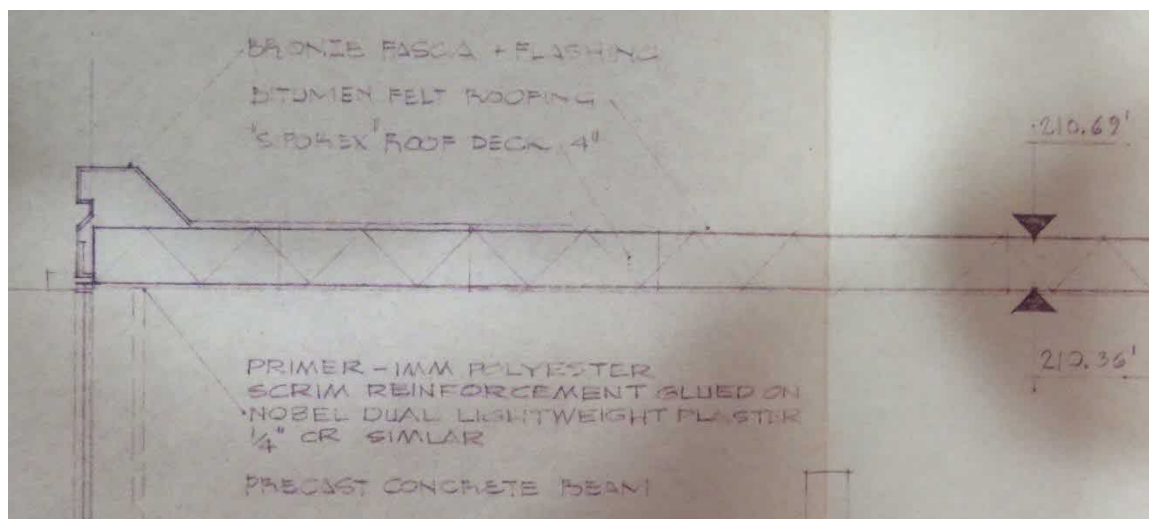
Designer: the work of one of the world's greatest architects and designers of the mid-C20, Arne Jacobsen, who considered it his favourite commission.

Degree of survival: despite some minor changes to areas of planting and paving, the structure of the landscape survives almost entirely, along with much of the original planting scheme, which includes carefully sited specimen trees; it retains its character and the strong identity created by Jacobsen, which also gives it the flexibility to sustain minor alterations.

3 The Need For The Works

It has always been known that the roofs of Staircases 1-8, Staircases 9-16, the Bernard Sunley Building, the Wolfson Library, the Dining Hall and the Administration Block were built using RAAC planks made by Siporex, as they are shown on the original drawings by Jacobsen, held in the college archive. The roof planks of the Wolfson Library, the Dining Hall and Administration Block are 4" thick (100mm), the roof planks on Staircases 1-8 and 9-16 are 5" thick (125mm) and the roof planks on the Bernard Sunley Building are 6" thick (150mm). RAAC is a construction material that had obvious appeal to designers, with its light weight, fire resistance, slenderness, and good thermal properties.

In all locations, the ends of the RAAC planks are supported on precast reinforced concrete beams 6" (150mm) wide, so the maximum bearing for the end of each plank is 3" (75mm). However, it is likely that not all of the planks will have this bearing, if they have irregular ends, or if end to end planks were not installed with equal bearings. All of the roof planks were originally covered by an asphalt roof finish or bitumen felt roofing laid directly onto the planks, but these have subsequently been covered with a variety of roofing membrane products in response to leaks.



Detail from a Jacobsen drawing for Wolfson Library roof, showing Siporex roof deck 4"

The College senior management team were aware that the Institution of Structural Engineers (IStructE) had published a guidance document in April 2023, combining much of the technical knowledge and latest advice. This refers to the failure of RAAC planks in a school in 2018, one of the most concerning aspects of which was that the planks failed and fell down without any forewarning of the failure. Subsequent analysis of the evidence suggesting that it was due to shear cracking at the support, combined with potentially misplaced reinforcement bars during their manufacture. It was also during a very hot period, so thermal influences could not be ruled out as a contributing factor. One of the more relevant parts of the IStructE reports mentions that the factor of safety for end bearings should be increased as follows- 'Any bearing less than 75mm would be considered substandard and present an unacceptable risk to panels from shear failure or slippage and remedial actions are recommended.'

The principal concerns with RAAC relate to:

- Corrosion of embedded reinforcement bars, due to water ingress leading to longitudinal cracks

- Excessive deflection caused by overloading and even self-weight only leading to transverse cracks and damage to roofing membranes.

- Panels acting independently of each other rather than as a whole structure.

- Insufficient end bearings leading to tensile cracks beyond or close to the embedded reinforcement bar zone.

- Poorly conceived or implemented openings and penetrations.

- Inappropriate repairs and repair materials.

- Susceptibility to damage during transportation, storage, and installation, and once in-situ, by drilling or fixing into the material due to its brittle nature.

The IStructE recommended that a thorough risk assessment is carried out for all buildings with RAAC planks. This exercise should involve identifying, referencing, and individually assessing each plank, of which there are thousands at St Catherine's College. Part of the initial assessment would be to measure any deflection wherever this was possible and to then categorise the risk of each plank based on all known and assumed factors. It should then be possible to identify priority planks in terms of the risk management based on location and area use, although the possible lack of end bearing would be a constant concern and could put all planks in the highest risk category from the start. Once the risk is assessed, there would need to be a decision made on whether planks could be maintained, temporarily propped, or scheduled for replacement. Clearly the cost and extent of disruption on site would be significant.

There was widespread headline coverage in the media during the summer of 2023 about RAAC roofs in schools and the decision by the Secretary of State for Education to increase the level of safety in schools with RAAC roofs. This was due to another failure earlier in the summer and resulted in some school closures at short notice just prior to the start of the autumn term.

St Catherine's College were already aware of the increased safety concerns due to the IStructE guidance and had engaged the structural engineers, AKS Ward, to carry out an assessment of the affected roofs at the College. The conclusion of the survey was that although the roofs of Staircases 1-8, Staircases 9-16, the Bernard Sunley Building, the Wolfson Library, the Dining Hall and the Administration Block have remained in place and have not yet deteriorated sufficiently to become a cause for concern, they are now 60 years old, which is now widely accepted as being double their 'useful' lifespan, according to the IStructE guidance.

It was accepted by the College governing body that the risk of plank failure was real, it was unpredictable and should not be ignored. The implications of a failure are obviously potentially catastrophic and therefore the issue had to be acknowledged and addressed with the urgent mitigation works and keeping other buildings closed except under specific circumstances. Ultimately the only feasible mid-to-long-term solution will be to replace all of the RAAC plank roofs, to eradicate the risk. Meanwhile, in the short-term, urgent mitigation works had to be undertaken, to ensure the safety of everyone on site.

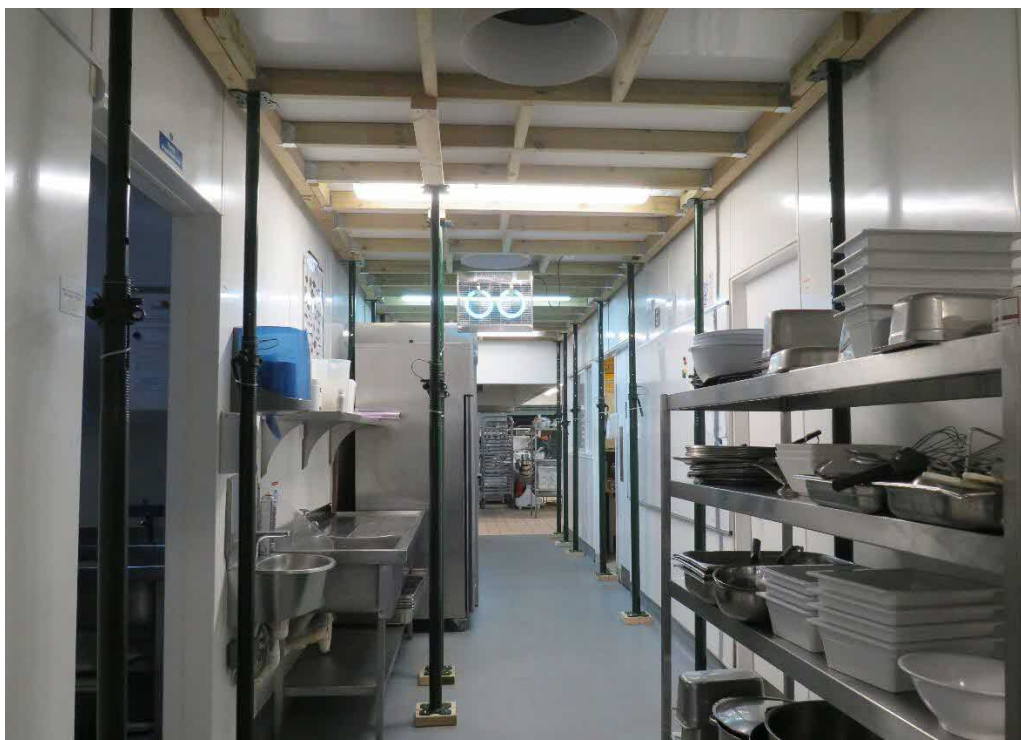
4 Temporary Mitigation Works Already Carried Out

Firstly, in order to be able to accommodate all of the 160 students who had been allocated second floor study bedrooms in Staircases 1-8 and Staircases 9-16 for the start of term in October 2023, the RAAC plank roofs had to be made safe with a system of timber joists to support each RAAC plank.

Secondly, with the Bernard Sunley Building, the Wolfson Library, the Dining Hall and the Administration Block all being out of bounds, the most urgent need was to provide an area for dining, a kitchen and some limited social space. This has been achieved by installing a marquee and a temporary kitchen on the lawn between the Master's Lodgings, gardeners work area and garages on the west side and the canal on the east side. There is also a marquee to the south of the JCR to provide a social area.

Thirdly, a small temporary food preparation unit was located near to the main kitchen as a short-term measure, supplemented by a larger temporary kitchen for cooking and a servery, at the north end of the dining hall main marquee. These urgent mitigation works are included in planning application (23/02716/FUL) and listed building consent application (23/02717/LBC), currently being considered by Oxford City Council.

Some areas of the roof of the main kitchen have been temporarily supported with a substantial number of Acrow props and temporary softwood joists below the roof planks, as shown below. This was necessary as some areas of the main kitchen facilities are still needed for food preparation and storage. The temporary propping within the main kitchen facilities is not included in those applications, since it does not connect to the historic fabric & is completely reversible.



View along kitchen corridor, showing Acrow props and timber joists supporting the roof

5 The Current Proposals

With the urgent mitigation works to the accommodation blocks and the temporary dining marquee, kitchen and JCR marquee now in place, the basic functions of living within the college have been able to continue. However, the Wolfson Library, the Bernard Sunley Building lecture theatre and seminar rooms and various functions within the Administration Block are still out of bounds, except to members of staff under specific circumstances.

In moving forwards and dealing with the need to replace the RAAC plank roofs, the current proposals are partly necessary in order to improve the lack of teaching facilities and partly to maintain the temporary catering facilities while the first stage of the roof repair works is undertaken, as outlined below.

Firstly, in order to improve the lack of teaching facilities, a temporary lecture theatre marquee is currently being installed to the south side of the dining marquee, with seminar spaces to the west of the temporary lecture theatre space. These spaces will improve the temporary facilities for the students and will allow St Catherine's College to continue hosting conferences, which it needs to do in order to help fund the works to replace the RAAC plank roofs on the original college buildings.



Lecture theatre marquee under construction, viewed from the turning circle at the south end of the access drive. Further photographs are included with the submitted drawings

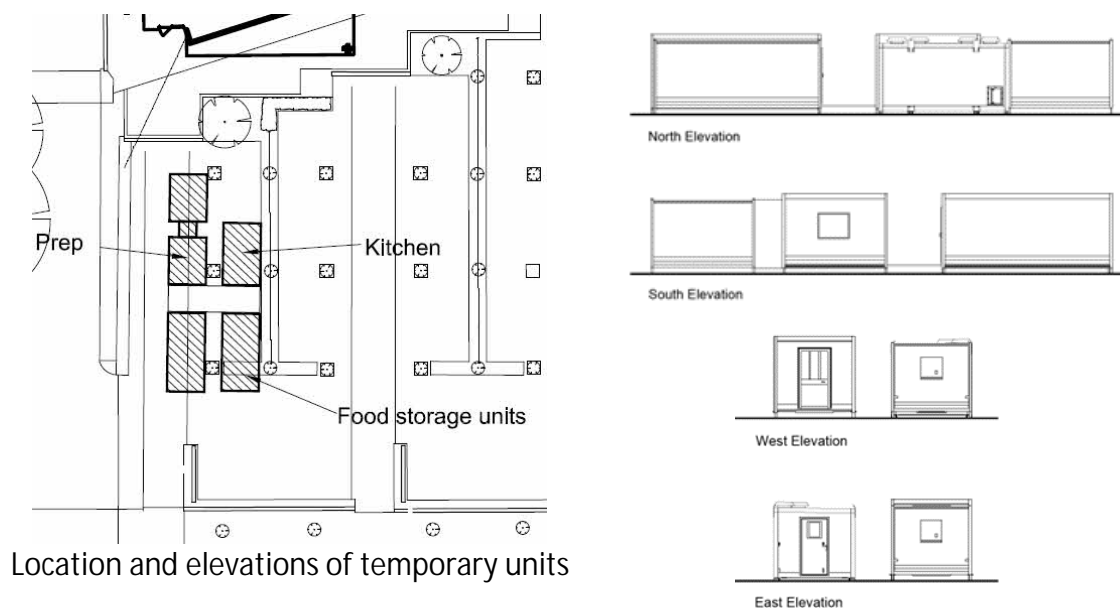
Secondly, the temporary kitchen at the north end of the dining hall main marquee is used for cooking and serving and still relies on the use of some areas of the main kitchen for food storage and preparation. This is currently possible, due to the temporary propping in those areas of the main kitchen.

However, whilst the detailed proposals for the permanent replacement of the RAAC planks are currently being developed, it has become clear that the first priority for replacement ought to be an area that includes the kitchen roof, so that the substantial costs of hiring the temporary kitchen units can be minimised. It then follows that in order to replace the kitchen roof, it will not be possible to continue using any spaces within the main kitchen for food storage and preparation during the construction works.

Consequently, it is proposed to temporarily locate some mobile food storage, preparation and kitchen units in the southern bay of the car park, which will then free up the main kitchen for the construction works to commence. The temporary installation of these mobile units in the southern bay of the car park is the second aspect of this planning and listed building consent application.



Front bay of car park, to be used for temporary food storage and preparation units



Location and elevations of temporary units

6 The Impact Of The Current Proposals

The impact of the works already carried out for the temporary lecture theatre marquee are difficult to assess in the accepted way, as set out in the Historic England document 'Conservation Principles, Policies and Guidance' (2008). This is because of the exceptional circumstances involving the updated advice for the RAAC roof planks and the need of the College to undertake urgent mitigation works to make areas safe and to still provide the required domestic and academic facilities. Under more usual circumstances with a much longer programme, the need for change can be predicted and managed and the impacts of the proposed changes considered in advance of any works being carried out. However, in this instance, this was not possible due to the urgent need to provide temporary teaching facilities with the lecture theatre marquee. In this context, it would be meaningless to retrospectively assess the impact of the works already carried out in the ways as recommended in 'Conservation Principles, Policies and Guidance.'

The proposals not yet carried out are for the temporary installation of food storage, preparation and kitchen units in the southern bay of the car park, which will be used to support the cooking and servery units at the north end of the dining marquee. This will then release the temporary use of some areas of the main kitchen, ready for the forthcoming permanent work to replace the RAAC plank roof over the kitchen area. The car park and the temporary units are shown above and in more detail on the accompanying drawings submitted for this application.

The proposed food storage, preparation and kitchen units will sit on the existing car park surface and will not require any foundations or other excavations, as they are of lightweight construction. The temporary units will not affect the existing rainwater drainage or the trees and power will be provided by loose laid cables, with appropriate temporary protection and ramping over. It should also be noted that these temporary units in the car park will also allow for the removal of the single temporary food preparation unit previously installed on the driveway near to the main kitchen, as that will need to be removed to allow for the construction work for the main kitchen area roof.

The proposed installation of the food storage, preparation and kitchen units in the southern bay of the car park will be a temporary installation and will be completely reversible without any works needed to the existing car park. The temporary units will be on hire to St Catherine's College, so the governing body will be keen to have the units returned to the supplier as soon as possible after the permanent RAAC plank replacement works to the main kitchen area, to minimise the hire costs. Consequently, there is no likelihood of the units remaining on site any longer than necessary.

With these circumstances in mind, it would be of no benefit at this stage to try and assess the impact of the proposed temporary installation of the food storage, preparation and kitchen units in the southern bay of the car park in the ways as recommended in 'Conservation Principles, Policies and Guidance' as they are not going to have a permanent effect upon the car park or the wider context of the site.

7 Accessibility

The doors into the temporary lecture theatre marquee have been provided with ramps with slip-resistant surfaces and the marquee has level floors throughout. An accessible toilet is available in the entrance lobby of the Wolfson Library and on the ground floor in the Porter's Lodge and whilst these are not adjacent to the lecture theatre marquee, these are the best that can be provided temporarily. The proposed temporary food storage, preparation and kitchen units in the southern bay of the car park will only be used by the kitchen staff, who do not have any accessibility requirements that need to be provided for.

8 Conclusion

As outlined above, due to the exceptional circumstances of the updated advice over the RAAC roof planks, some urgent mitigation works have had to be carried out at St Catherine's College in order to provide the required domestic and academic facilities and the temporary lecture theatre is part of that works.

The proposed temporary food storage, preparation and kitchen units in the southern bay of the car park are required, in order to release the main kitchen areas still being used for food storage and preparation, ready for the forthcoming permanent work to replace the RAAC plank roof over the kitchen area.

In conclusion, the circumstances that have led to the need for the retrospective application for the temporary lecture theatre marquee have not been ideal but they have been unavoidable. A planning and listed building consent application for the works to replace the RAAC plank roof over the kitchen area is being prepared and will be submitted as soon as possible. Consequently, the works already carried out and the works proposed should be granted permission.