Strategy and Action Plan for Embedding Sustainability in Capital Projects

Bush House looking south down Kingsway.

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1.0 Introduction

King's overarching **Environmental Sustainability Policy** lists a series of commitments to sustainability, one of which pertains to '**Construction and Refurbishment**'. The policy commitment states that King's will '*manage construction, refurbishment and post completion occupancy of our buildings to reduce environmental impact and enhance wellbeing of building users'.*

King's other operation related sustainability policies and strategies include the Energy and Carbon Management Plan 2020, the 2021 Decarbonisation Plan, Waste and Resource Management Policy 2021, its accompanying Waste Strategy and Action Plan 2021-2024 and the 2019/2024 Biodiversity Action Plan amongst others, each of which are directly related to this Strategy and Action Plan and play an integral part into how we embed sustainability within our built environment.

In fact, each of King's sustainable policies and actions plans incorporate the UN's Sustainable Development Goals (SDGs). This strategy and action plan's main driver is SDG 11, Sustainable Cities and Communities but is also driven by several others; more specifically SDG 9 Industry, Innovation and Infrastructure and SDG 12 Responsible Consumption and Production. The sustainable construction and refurbishment of our buildings and of our infrastructure is fundamental to achieving King's vision for sustainability by driving a reduction in operational impacts including costs and carbon, whilst providing enriched teaching and learning facilities.

However, it was the findings of a survey, circulated to the capital projects team in 2020 that indicated the need for a separate strategy and action plan for embedding sustainability into capital projects. Such a document was considered central to ensuring sustainability is embedded even further into capital projects and our wider built environment. The findings of the same survey also indicated that procuring for sustainability experts in the built environment to work alongside project teams on an as needed basis was also important. Finally, the survey findings also indicated that achieving sustainable accreditations for projects was the most suitable methodology for reaching our net zero carbon target by 2030 and that extensions to budgets for sustainable building materials and services was also required.

1.1 King's Vision 2029 and Strategy 2026

This strategy is also in line with King's Vision 2029 and its supporting 'Strategy 2026: our focus for the future'. Vision 2029 sets our ambition 'make the world a better place through excellence in teaching, research and service to society'. The Strategy 2026 consolidates and build on those strengths and success and advances King's distinctiveness, to be a leader in education and research for our transition to net zero. In fact, the climate crisis is one of the greatest challenges facing society today and King's is in a unique position to contribute to solutions to these challenges.

1.2 Climate and Sustainability Action Plan

King's has been taking action on climate and sustainability for a number of years, developing our first Carbon Management Plan (CMP) in 2006 and setting the target to reduce scope 1 and 2 carbon emissions by 43% between 2005-06 and 2020, in 2010. In 2023, the Climate and Sustainability Action Plan was created, setting out key impact areas across King's operations where actions need to be taken to deliver on our net zero carbon target by 2030. One of the key impact areas is Property and Construction, which included 8 objectives and 15 interlinked targets. More importantly, the action plan assigns responsibility and accountability for each of the actions and identifies the resources (human and financial) required to deliver of each of the objectives.

King's recognises that living within our planetary boundaries is one of the key challenges that must be addressed to create a thriving and healthy global society in the future. The 'E' in 'serve' stands for environmental sustainability and King's has made a commitment to protect the environment through its operations. This strategy and action plan puts that commitment into practice by making clear to stakeholders the steps required to ensure sustainability is embedded within capital projects and why those steps are considered necessary. Creating a sustainable estate that has also considered the social value it brings to its wider community is part of that strategy. Moreover, King's is also committed to prioritising activities that enables our financial sustainability.

1.3 Challenges of the King's Estate

Embedding sustainability into capital projects represents a major challenge for King's, as the estate consists of a mixture of Grade II listed buildings and newer, more modern buildings that are continually being refurbished and re-purposed. Where older protected buildings are concerned, some sustainable initiatives might be restricted, and in many instances, prohibited. King's buildings vary in age, size, and style, and depending on their location, can have a multi-purpose use in supporting teaching and learning.

There is an opportunity however, to make significant energy savings through the refurbishments of existing buildings, via the new heat decarbonisation plan, the majority of which were constructed between 1940 and 1979. There is also opportunity for energy savings in the construction of new buildings if sustainability is designed in from the beginning and not value engineered out at a later stage.

This strategy and action plan considers the use of the campuses' existing infrastructure as well as the estate's overall energy performance. Maintenance and operations activities have also been considered as well as the 2021 Heat Decarbonisation Plan which includes a strategy for improvement for each building. Combined, they will provide a more holistic approach to embedding sustainability across the estate and progress King's toward operating as a net zero carbon institution.

1.4 Existing Guidance Documents

In 2016, King's produced the Sustainability Guidance-Capital Projects Brief, document outlining a framework for the delivery of sustainable design and construction projects, that would support the policy objective to "manage activities, buildings and estates, to promote environmental sustainability, to conserve natural resources and prevent environmental pollution and to bring about a continual improvement in environmental performance". Revised in 2017, all construction and refurbishment projects, regardless of size, are expected to consider the requirements set out in the document and wherever practicable seek to enhance the sustainability performance of our estate. KCL's **Sustainability Guidance (Capital Projects Brief)** requires all projects to;

(i) Consider sustainability and contribute to meeting sustainability targets and strategic objectives

(ii) Create world-class facilities that inspire excellence, providing healthy spaces that connect with the community

(iii) Use sustainable design principles and integrate Passive Design to minimise resource consumption and provide high quality environments

(iv) Use Whole Life Cost/Life Cycle Cost Analysis and modelling to demonstrate compliance and value, where appropriate

(v) Achieve or exceed relevant accreditation – depending on the scope of the project and planning requirements.

However, the guidance document appears not to have been adhered to, as closely or as frequently as expected as the 'golden thread' of sustainability appears to have been lost in several projects. While a few of King's buildings have achieved BREEAM or Ska certifications, the majority were for 'shell stage' only. This is due to a number of factors that typically include scope, time, and budget restrictions. As a result, we have ended up with an estate that is not as sustainable as we'd aimed for, and in 2021 is proving to be a hurdle for the capital projects team when needing to raise stakeholders' confidence. For this reason, an accompanying strategy and action plan for embedding sustainability into capital projects was considered necessary as it would serve multiple purposes, four of which are listed below.

1.5 The Purpose of this Document

The purpose of this strategy and action plan, is therefore to

(i) act as a roadmap for the wider Estates and Facilities teams, particularly project managers, to ensure the 'golden thread of sustainability' is not omitted from projects,

(ii) to further inform King's stakeholders of our commitment to embedding sustainability into our built environment by acknowledging mistakes were made but that lessons have been learned,

(iii) to give confidence to decision makers (financiers, campus planners, directors of operations etc.), that the capital projects teams are committed to creating a holistically sustainable estate and are clear about their roles in ensuring its delivery through each of their projects.

(iv) make clear the benefits of aiming for alternative sustainable accreditation schemes on a case-by-case basis.

The strategy and action plan also reflects key elements of the King's Climate Action Strategy, the Estate Strategy, the 3 Year Functional Plan and the 2021 Update paper on the Re-examination of the Capital Project's approach to

embedding Sustainability (Environmental and Social) into King's built environment. In line with the college's other sustainability policies, it will support the college's strategic driver for building excellence as well as our ambition to embed sustainability and social responsibility into all our processes, operations and developments.

In fact, when the Project Managers Guide to Process and Procedures for Managing Capital Projects was revised in 2020, reference was made to the importance of embedding sustainability in each of our projects from the beginning and throughout. No other university, whose estate is similar to that of King's, appears to have a separate Strategy and Action Plan for embedding sustainability into their Capital Projects. This is due to the uniqueness of the King's estate, so our approach needs to be less prescriptive and more flexible by being open to changes in practice as they happen. Over the next 20 years such changes, guided by sector organisations such as BSRIA, RIBA, CIBSE etc., are likely to include stricter requirements around energy sources, durability of building materials, inclusion of biodiversity etc. and will be in an effort to design and construct projects that will withstand the effects of climate change.

Central to the strategy and action plan is ensuring King's buildings achieve sustainable accreditations.

2.0 Sustainable Accreditations

2.1 The Principles of Accreditations

There are several sustainable accreditations for the built environment on the market today, namely, BREEAM, SKA, PassivHaus, LEED, NABURS, and WELL Build, to name just a few. There is also the option of conducting bespoke assessments, where accreditation is not achieved but the building is still regarded as being sustainable. Each of the accreditation schemes, by applying a set of quantifiable criteria, examine how and where environmental criterion such as energy and water use, proximity to public transport, cycling facilities, building materials used, access to outdoor green space and biodiversity, were considered as part of the building's design and more importantly, its construction.

2.2 The Benefits of Achieving Accreditations

An accreditation from a recognised organisation validates a project as being built to a sustainable standard – without it, a building or refurb might not be regarded as sustainable. They allow for the measurement and comparison of the sustainable performance of buildings. Accredited sustainable buildings outperform conventional 'un-sustainable' buildings on environmental, economic and social parameters and has increasingly broadened in its meaning resulting in certifications broadening their scopes and requirements to keep up. Regardless of the accreditation scheme, they each provide comprehensive frameworks for designers, architects, contractors and operations teams to verify the inclusion of sustainability throughout the project.

End user satisfaction increases as running costs (energy, maintenance, etc) of a certified building are typically less, temperatures automatically adjust to changes in weather, the spaces are correctly illuminated and are decorated to a modern style. This in turn results in greater productivity, as the wellbeing of end users also improves. Higher rental and sales value can be achieved as more clients insist on their space having a sustainable accreditation, which is also an advantage in the commercial real estate market. King's reputation as an environmentally sustainable institution will improve as stakeholders often inquire about sector recognition regarding our sustainability performance. This in turn directly impacts staff and student satisfaction with knock on effects of improved retention figures for both. The benefits can therefore be summarised as a combination of financial, operational and reputational.

However, it's often difficult to calculate the overall cost of sustainable accreditations to King's when compared to the total cost of either individual or combined projects as accreditation costs vary between schemes, buildings and consultants. In addition, costs are often absorbed into the consultants' fees making the distinction less clear. Across the sector, such costs are considered to be anywhere between, 0% to 1.71% of the total cost for office and school buildings, and up to 5.51% of the total cost for a healthcare building to achieve an Excellent rating if located in a 'poor' area i.e. with no links to public transport or network connections to sustainable energy. Also accreditations typically only last an average of 5-7 years and can be compromised as soon as refurbishments happen within the scope.

Up until now King's have not been recording the costs associated with achieving accreditations, making the post build cost analysis of accreditations less obvious and therefore difficult to determine. It also makes the cost between the same accreditation

schemes in different buildings, incomparable. This in turn has impacted King's ability to determine the true value for money of achieving BREEAM or Ska.

Moving forward, as part of this strategy and action plan, King's are committed to ensuring the costs associated with accreditations are isolated from consultants' fees and are calculated based on the cost per project. This will help determine the overall value to the college of achieving accreditations and of creating a more sustainable estate. The benefits to King's from accreditations include sector recognition as well as quantifiable evidence of our journey toward being Net Zero Carbon.

2.3 Sustainable Accreditations on the Market

Some of King's building stock and capital project works have already been accredited with BREEAM or Ska – albeit only to 'shell stage' – evidencing that King's estate is already embedding sustainability into its capital projects. However, several other accreditation schemes exist which have demonstrated greater energy efficiency across the sector as well as offering a framework for better environmental performance that includes health and wellbeing. Those schemes include

- EnerPHit – use of the Passivhaus methodology for new builds and retrofit.
- LEED – very similar to BREEAM but scored with star ratings and incorporates integrated project delivery and solar reflectance.
- WELL – where human health and well-being is considered in the design and construction/ refurbishment of a building as well as sustainability.

To achieve any form of accreditation, the university requires the use of sustainable design principles, including performance modelling and where appropriate whole life costing. Where previously the cost/value of the build and the planning requirements decided the accreditation scheme aimed for, additional deciding factors now include;

i. scope of methodology of accreditations (is the accreditation a good match for the project),
ii. cost/value of the accreditation to the King's estate – what is the lifetime value of the accreditation,
iii. overlap with previously accredited existing infrastructure,
iv. plans for future works in adjoining building or nearby spaces.

There are various approaches to embedding sustainability within a university estate. Where some buildings are used for a mixture of purposes – offices and lecture theatres as well as laboratories and research hubs – it is argued that a mixed approach might result in an unbalanced assessment of a buildings performance and should be avoided.

Regardless of which accreditation scheme is aimed for, the overarching target of being a net zero carbon institution by 2030 and how we can evidence it, needs to be considered. The decarbonisation of our energy and heating systems and therefore reaching our net zero carbon target is best achieved by acting on the recommendations of our 2021 Heat Decarbonisation Plan.

2.4 The Heat Decarbonisation Plan

In 2020 King's was awarded funding from government's Heat Decarbonisation Scheme - a scheme that provides grants for public sector bodies in need of funding for heat decarbonisation and energy efficiency initiatives. Subsequently, the 2021 King's Heat Decarbonisation Plan was drafted and includes each of King's 71 buildings. The plan aims to replace old underperforming plant and equipment with newer, more efficient ones. The plan will also incorporate building fabrics and building materials to ensure heat is better retained and running costs remain low.

2.5 Sustainable Accreditations of King's Buildings Stock in 2021

Despite being pre-assessed with Ska and BREEAM ratings, many of our current stock of buildings has failed to deliver on their predicted sustainable performance on completion. In fact, only a few of our buildings have been accredited with Ska or BREEAM post build. This is in part due to sustainable materials and initiatives being 'value engineered out' during the construction phase to save money, paradoxically costing the college more in running costs year on year. Conducting a post build assessment to achieve a BREEAM or Ska accreditation is sometimes itself 'value engineered out' in an attempt to save on costs. Paying for certification years after the project is completed may be considered pointless as the quality of the building fabric will have deteriorated. Accreditations are sometimes considered an unnecessary use of funds where they are not part of the scope or if buildings are likely to be refurbished again within 3-5 years.

A disconnect between the capital costs (capex) and operating costs (opex) of a building is another reason why some of King's buildings year-on-year running costs are unsustainable. As the scope and budget of a project will determine the choices made when purchasing and installing equipment, too often equipment with the least expensive purchase price will be chosen, with little consideration given to its operational costs. This results in the completion of buildings that are sustainable to 'shell' only stage, but not when fully equipped, furnished, occupied and in use.

3.0 Lessons Learned

3.1 Maintenance, Operations, I.T. and Infrastructure

Reflecting on how and why the golden thread of sustainability was omitted from projects formed the basis of lessons learned at King's. Identifying the gaps between guidance written into the existing suite of documents and the 'on site' design and build process formed the basis of the strategy and action plan.

Input from maintenance, operations, I.T. and infrastructure was not being considered at the design stage, directly impacting the financial and carbon cost of its maintenance over its lifetime. Teams working on the mechanical and electrical operations of the building should be able to identify where potential issues are likely to arise and make suggestions to avoid them. The infrastructure team should also be consulted to ensure minimal clashes with existing or planned estate infrastructure projects that may result in the compromise of completed projects or delays to planned projects. Other buildings operations including smaller campus projects, portering, cleaning, landscaping and the general use of the building is also be considered as part of this strategy and action plan. I.T. is also be included in design stages to ensure buildings can easily accommodate the continual refresh of I.T. systems including, server rooms, cooling systems, internet access points etc. While the end use of the building will determine the type and level of I.T. systems required, an easily adaptable and accessible I.T. infrastructure is essential to the long-term use and therefore sustainability of a building.

3.2 Post Occupancy Evaluations and Building Users Guides

Post occupancy evaluations (POEs) were not being carried out and as they typically include a building users guide they too were not being completed. It's essential for lessons learned that post occupancy evaluations and their accompanying building users guides should be created to establish how, once completed, the buildings or spaces within it should be used. Users understanding of how a building's functions is critical to user experience of it and to its long term performance. A holistic understanding of a buildings design intent, typically held by a relatively small number of people across the estates and facilities directorate, should be shared with all stakeholders and available online. Once created, communicating its existence, how it can be accessed, and what it contains should deliver significant performance improvements and overall levels of building user satisfaction. The

buildings users guides will vary between buildings' function and complexity. User guides should consider the range of staff knowledge and staff turnover, should be produced by the main contractor for all occupant facing systems and controls, and should signpost the key sustainability initiatives for operational buildings. Currently, there is little evidence that King's have conducted post occupancy evaluations on any of their projects. This is primarily because the focus in previous years was on completing the project before the deadline on and ensuring the client had occupied the space. It was also due to limited availability of resources. King's appreciate that POEs are essential to the completion of a project and are even a requirement of certain accreditation schemes so have included them in the action plan.

3.3 Life Cycle Costs

Central to calculating the maintenance, operations and infrastructure cost of a building, a life cycle cost analysis (LCC) (also referred to as whole life costing (WLC) should be included, but only where appropriate as they incur a cost in and of themselves. These tools predict the capital costs (capex) and the operational costs (opex) of a building and therefore the long term use and sustainability of a building. The additional costs of attaining fire certifications, determining flow loads and signing lease agreements also factor into the total number of occupants allowed in a building at any one time. Exceeding such limits not only breaches health and safety but due to additional wear and tear but results in shorter life spans of the building, making it less sustainable.

4.0 The Action Plan

The focus now needs to be the inclusion of sustainability from the concept stage until the final post occupancy evaluation report, i.e. from the BRISA's 6 stages, and /or RIBA's 8 Phases of soft landing. The agreement from all stakeholders that sustainability is non-negotiable and cannot be value engineered out is essential throughout the lifetime of the project. There also needs to be agreement that derogation from the agreed sustainable accreditations will not occur and that a senior responsible owner (SRO) will take responsibility for delivering on the agreed accreditation. Focussing on the desired **outcomes is key and agreeing** the sustainable priorities is central to and forms the basis of the action plan.

This strategy seeks to include other accreditation schemes on an as needed and most suitable basis. This strategy will also adapt to changes in each of those schemes in

order to mitigate climate change. The Action Plan tabled below sets out how King's intend to embed sustainability into our Capital Projects across the estate, per criterion.

Key elements to success –

None of the accreditation schemes include Social Value but information on how this should be incorporated into Capital Projects at King's has been included in the Soft Landings Document.

Table 1 Strategy and Actions for Embedding Sustainability into Capital Projects

Strategy Point	Action	Sub Action	Overlap with Climate and Sustainbaility Action Plan
1. Updating of the suite of 'Sustainability in Capital Projects' documents.	Revise and update the following documents to ensure compliance; (i) Sustainable Design Specification for Buildings and Infrastructure works (2014) (ii) Projects Sustainability Checklist, (iii) Sustainability Guidance Capital Projects	Retain the services of an expert consultant on the subject of embedding sustainability into the Built Environment.	Ref 11.

	Brief, (iv) King's Soft Landings Standard.		
2. Appointing a Singular Responsible Owner (SRO) or a 'Super 'SRO (typically a VC or President)	Each SRO will take ownership of their project and in doing so specify sustainable priorities and ensure the delivery of the desired building.	Prior to starting works on a project, appoint an SRO and collectively agree which of the non-negotiable sustainable criterion (energy, biodiversity, access cycling facilities, etc.) should be the focus of the project. The SRO should ensure that (i) equal weighting is placed on each of the sustainable criterion, (ii) there is a sufficient budget for the sustainable materials and services required, (iii) contractors experienced in building for sustainability are hired.	Ref 10-17.

3. Soft Landings Document to include Sustainability	From project inception to the design and build stages, to commissioning and handover, sustainability is to be included at each of the project's pitstop. A newly revised Soft Landings Document has been drafted as a reference point for this. The SC will ensure sustainability is communicated to all contractors and the golden thread of sustainability is carried throughout the project. The SC will follow each of the RIBA stages. Following on from the final stages of the build – a thorough POE needs to be carried out at the +1 year stage and indeed +3 if required with findings bring reported to; whether part of the accreditation or not.	**(i) Design Team** – The design strategy to be approved by the SC and PM (section 2.5.1.2 -2.5.1.4). In keeping with the PM guide to the design team should include sustainability in their design. This should include the use of energy efficient, low carbon, recyclable building materials as well as incorporating biodiversity and sustainable travel initiatives. Sustainable design should include the PM and SC in addition to the standard QS, architect and 'designers' of the structure and fabric buildings as oppose those who services the building thereafter. **(ii) Whole Life Costing/ Life Cycle Costing** - WLC or LCC is to be considered in the Soft Landings of project. An agreement needs to be in place. **(iii) Replacement Building Fabrics.** Agreement of negotiable / non-negotiable replacement of building materials and	Ref 10 ,11.

		fabrics for more sustainable ones. Clarification on what changes to the design spec and scope of the project can be made to incorporate any necessary changes and how such changes might affect the WLC /LCC and therefore the sustainable performance of the project? Discussion around 'value engineering out' should be included as part of soft landings and only be carried out where a delay in completion of the project is likely to occur.	
4. Maintenance of an up-to-date Masterlist of projects.	The document will consist of 5 columns (Name of Project, Project Manager, Sustainable Accreditation, Stage of Project, Progress, Last updated and Next Meeting) and be stored in the Sustainability in Capital Projects Teams Folder for easy access by each of the PMs. (This masterlist is essentially an up to date 'live' spreadsheet of current capital projects and includes the	The Sustainability Manager will update this Masterlist – with each PM also updating it as their projects progress – notifying the Sustainability Manager as and when changes occur.	Absent.

	sustainability accreditations being aimed for along with the stage and overall progress the project).		
5. Embed sustainability into the wider Estates Plan of Works.	The Estates wider Plan of Works which is part of the Soft Landings Document to be checked to ensure there are no clashes with other works with other departments such as the I.T. department, campus operations or the Heat Decarbonisation plan. Efficiencies are to be agreed in advance with sustainability being designed in and never 'value engineered out'.	The various Estates and Facilities teams (operations, maintenance, infrastructure, IT, energy will be required to update this with current and future plans for works). Head of Capital Projects to oversee the timelines, scopes and cost of project to ensure clashes are avoided.	Ref 10.
6. Continual Delivery of Training and Education in Sustainability within the Built Environment	Training and Education on how to embed Sustainability in the Built environment will be provided to all Capital Project staff. As part of this training, staff will be made aware of how actions within their remit contribute to the universities overarching target of being Net Zero Carbon.	The Capital Projects team/PMs will complete a series of training provided by sector organisations (BSRIA, UKGBC, AUDE etc). This will ensure each PM is trained in sustainability and completion of their training will be monitored. Completion of CPDs and feedback from training supplier will help direct further training for PMs – to ensure sufficient and	Ref 13

		up to date bespoke training is provided where needed. The Sustainability Manager will monitor PMs training and ensure bespoke training is arranged as and when needed.	
7. Liaising with Procurement Team at Stage 1 or Phase 1 of the project	The procurement team should be included at the inception stages of each project to help deliver value for money. The procurement team's role in ensuring products and services are procured through sector frameworks thereby mitigating supplier related risks. The procurement team should provide an integrated approach to delivery and risk management in the procurement of project-related goods and services and will be included in all decisions that affect the overall build and operational cost of the project. The sustainability manager (operations) to be included in stage gate process.	The procurement team will be included in the soft-landing process and attend each of the project's pitstop meetings to provide expert advice on how best to procure for suppliers, contractors, etc. Incorporate soft landings requirements into tender documentation and evaluate.	Ref 17

8. Appointment of Sustainability Champions (SC) for each Project	Each project will have a Sustainability Champion (SC) assigned as part of that project's team. This may be the PM and/or the sustainability manager or an external contractor/ supplier.	The SC will ensure that the revised soft landings procedure is adhered to and sustainability pitstops are not overlooked/compromised.	Absent
9. Communications	Communications needs to be up to date, clear and accessible to both internal and external stakeholders. Communication platforms should include webpages and Microsoft Teams Folders in addition to Zutec, e-mails and calendar invites for meetings. **External:** Contractors and suppliers to have access to our webpages that make clear our net zero carbon target and their roles in helping us achieve it. Similarly sustainability to be included in tenders for contracts and in final contracts. **Internal:** Internal webpages to make clear our net zero carbon target and their roles in	**Internal:** To communicate with Department Administrators / Business Managers about their business case. This will involve working closely with departmental team(s) to collaborate on how best to use our existing buildings stock to minimise operations costs and maximise the life span of the building. Internal teams to include timetabling / room-booking and space management, Events Team, Building Users Groups, etc. Within the Capital Projects Teams regular capital project meetings / quarterly updates to Head of CP /Sustainability Team on the progression of sustainability within each	**Absent**

	helping us achieve it. Internal pages should in include a Tab for departments making the business case for a new buildings / refurb/ smaller projects that includes a template document containing sections on sustainability accreditations.	project will be provided by the PM and SC in an effort to counteract working in silo - In line with Action 1, 3 and 4, the PM will update the Sustainability Manager on any changes that are required. Webpage termly meetings etc.	
10. Incorporation of Campus Operations	Examination of all Campus Operations to establish where overlap or conflict may occur.	Prior to starting works on a project, hold a meeting with building operations managers to establish where issues are likely to arise.	Ref 10,
11. Extending to Campus Projects	Communicating the principals of sustainability to campus project managers to ensure the golden thread of sustainability is maintained throughout the estate.	The sustainability manager for operations to provide the mini-ska tool and list of ska and bream approved building materials to campus project managers.	Ref 10,
12. Completion of Post Occupancy Evaluation Report and Building User Guides.	Evaluation of Capital Project is an essential performance management and continuous improvement tool. Using the Government Skills Funding Agency Guidance documents on Post Occupancy Evaluation Reports the	(i) The 'Post Occupancy Evaluation (POE) report should be written highlighting the success of the building as well as the 'lessons learned'. The document will include the sustainable outcomes of each project and will report	Ref 10, 16.

	outcome of major capital projects, including acquisition and disposals where applicable. The 'Post Occupancy Evaluation (POE) report should be written highlighting the success of the building as well as the 'lessons learned'. The document will include the sustainable outcomes of each project and will report against the main environmental Aspects; Energy, Water, Waste, etc. The POE Report will be shared with the wider Capital Projects and Estates and Facilities teams for input and stored on the Teams Folder for everyone.	against the main environmental Aspects; Energy, Water, Waste, etc. The POE Report will be shared with the wider Capital Projects and Estates and Facilities teams for input and stored on the Teams Folder for everyone. (ii) The PM and SC will co-write the end of project report which will include 'Lessons Learned' as well as highlighting the 'Easy Wins'. (iii) Ensure that the accreditation certificate must be submitted to the King's PM at handover. The Lesson learned to be shared with contractors, subcontractors, suppliers highlighting what the problems explaining what the problems were and how the negatively impacted the project (For e.g. 2 weeks delayed getting on site). Moving away from working in silo establishing the actions that worked well as well as those	

		that did not This information to communicated back to everyone on the team thereby ensuring ongoing improvement of the strategy and action plan.	

Figure 1.0 Incorporation of Sustainability in a Project Life Cycle.

Lessons learned, must be communicated back through the project cycle of information. This will ensure all stakeholders are aware of their role in ensuring mistakes are not repeated as well as sharing 'quick wins'. A master list of lessons learned needs to be created and populated by each of the project managers during and at the end of each project, so mistakes are not repeated, and project hacks and sustainable quick wins are shared with the wider capital project team.

5.0 To Conclude

5.1 The importance of incorporating this strategy

This strategy and action plan is central to King's reaching its Net Zero Carbon target by 2030. It is also central to giving project managers the impetus and authority to embed sustainability into refurbishments and new builds as well as providing a clear roadmap on how to ensure its delivery. It offers guidance on the importance of engaging with other departments at King's whose input is essential to the longevity, sustainability and overall maximisation of the use of each building. This strategy is a live document that reiterates the importance of the use of necessary bespoke tools as well as making clear the roles and responsibilities of project managers as well as members of the wider Estates & Facilities Team, in ensuring sustainability is embedded across the King's estate.

5.2 The Para-Covid Campus

COVID-19 pandemic has afforded King's the opportunity to rethink our approach to embedding sustainability across the estate so we can 'build back better' and reach our Net Zero Carbon Target by 2030. Other sustainability enablers and initiatives exist at King's, namely the Climate Action Network Group and each of its 7 subgroups, collectively and holistically contributing in a unique way to a more sustainable estate. In addition, King's are accredited with the environmental management system ISO14001:2015 and has active staff and student sustainability champions. The findings of the 2021 IPCC report indicated that action on climate change is even more urgent as the time remaining to stop global temperatures from increasing by 2 degrees and subsequently from reaching the point of no return, is running out. Already, the UK is experiencing changes in our national weather and winters are projected to become on average warmer and wetter and summers to become hotter and are drier. Well-designed buildings and infrastructure constructed using durable, long lasting materials producing low carbon buildings with longer life spans is central to mitigating the impact of climate change. Buildings that do not deliver on their whole life carbon performance will prove to be an expensive liability for future generations as they will need to be retrofitted to be Net Zero Carbon by 2050. Alternatively, buildings that do, will provide an excellent return on investment.

RCIS are looking at their international measurement's standard and calculation of net zero so leaving our strategy ‘open to adaptation’, allows us adopt the use of industry calculators to demonstrate progress on projects for sustainability and to quantify our net zero carbon status.

Adhering to this strategy and action plan will not only minimise our carbon footprint but will save the college money. By incorporating sustainable design into each of King’s refurbishment and new builds, investing in sustainable materials, adopting a holistic approach that includes the various King's buildings support teams and a move away from ‘value engineering out’, we can create a campus that is environmentally and financially sustainable that will reap rewards for the college long after the completion of projects. In fact, our a newly revised suite of documents pertaining to sustainability in our built environment will demonstrate that our estate is not static but is instead aware of the urgency of taking climate action by changing the way we do business across the college. We are embedding sustainability in a more holistic, practical and up to date way.

The End.