St. Andrew's Gate, Town Centre Extension, Uxbridge
Hybrid Planning Application: Full Element

Former Cinema Building Energy and Sustainability Statement (including Whole Life Carbon and Circular Economy)

ST. ANDREW'S PARK
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Energy and Sustainability Statement

Vinci St Modwen

Former Cinema Building

Final

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1. INTRODUCTION

1.1 This statement has been prepared in relation to the refurbishment of the Grade II listed former cinema building at St. Andrew's Park Uxbridge, which is identified as a 'Priority A' building on Historic England's 'Heritage at Risk' Register. It is submitted in support of the full element of the hybrid application only and provides an overview of the approach to energy and sustainability matters. The development description is as follows:

"Hybrid planning permission comprising:

> *Outline planning permission (with all matters reserved) for residential development and commercial uses, to be occupied flexibly within Use Classes E(a), E(b), E(c), E(e), E(g)(i), E(g)(ii) and a convenience store (Use Class E(a)); plus car parking, hard and soft landscaping, and all other associated works.*

> *Full planning permission for reinstatement of gym use (Use Class E(d)) and change of use to provide a café (Use Class E(b)) within the former cinema building; and external alterations; and associated car parking, hard and soft landscaping and all other associated works.*

Masterplan to be delivered on a phased basis with Full proposals for the former cinema building to be delivered alongside Outline phases."

1.2 The energy efficiency and sustainability of the building has been considered through the design development of the proposals. Measures have been incorporated into the scheme to ensure the energy efficiency and sustainability measures have been optimised and sensitively integrated to ensure the significance, character and appearance of the heritage assets is successfully retained.

1.3 The listed status of the former cinema building places obtrusive constraints on the ability to enhance the energy performance of the building. Any measures to enhance energy performance within the building are required to sustain the listed building's character and appearance in accordance with planning policy and guidance and building regulation requirements.

1.4 The following sections of this statement set out the following:

> Section 2 – provides an overview of the building;

> Section 3 – sets out the planning policy and guidance context in relation to energy, sustainability and heritage matters;

> Section 4 – details the Building Regulation requirements for listed buildings ;

> Section 5 – sets out the proposed energy efficiency measures;

> Section 6 – sets out the proposed sustainability measures;

> Section 7 – sets out the proposed whole life cycle carbon measures;

> Section 8 - sets out the proposed circular economy measures;

> Section 9 - provides a summary and conclusion.

2. THE FORMER CINEMA BUILDING

2.1 The former cinema building is Grade II listed and is identified as a 'Priority A' building on Historic England's 'Heritage at Risk' Register. 'Priority A' is defined as a building which is at 'immediate risk of further rapid deterioration or loss of fabric'. The building was constructed in 1919. It comprises of two main volumes; the Main Hall and the former Squash Courts. The proposed scheme will reinstate the gym use in the Main Hall and associated ancillary spaces and would provide a café in the former Squash Courts. Further detail of the historic significance of the building and its importance as a heritage asset is set out in the Heritage Statement in relation to the Full element of the Hybrid application and the parallel Listed Building Consent.

2.2 Lime plaster is present within the building and is permeable to moisture vapor, allowing buildings to "breathe" by regulating humidity levels effectively. This property helps prevent moisture buildup within walls, reducing the risk of mould growth and structural damage. Lime plaster can accommodate slight movements in the building without cracking. This flexibility is helpful in relation to historical structures and can contribute to the overall longevity and lifespan of the building. The proposed scheme will replace lime plaster where required within the building. Increasing wall linings to insulate the building has been discounted from the scheme as additional wall linings have the potential to trap moisture in the walls and lead to issues such as damp, mould growth and deterioration of the historic plaster and historic underlying structure.

2.3 The roof covering of the Main Hall was replaced in 2020 and the existing shower room (first floor extension from the western elevation) roof covering was replaced in 2022. These works were undertaken as emergency works, in agreement with the Local Planning Authority, to ensure the building was water-tight and prevent its condition from further deterioration. The recently installed roof coverings will be retained as part of the proposed scheme.

3. PLANNING POLICY AND GUIDANCE CONTEXT

3.1 The following sets out an overview of planning policy and guidance which is relevant to both energy and heritage matters.

Strategic Planning Policy & Guidance

The London Plan (2021) & Energy Assessment Guidance (2022)

3.2 London Plan (2021) Policy SI2 seeks to minimise greenhouse gas emissions. The supporting text in relation to Policy SI2 clarifies that the policy relates to development involving major refurbishment and that further guidance regarding the application of Policy SI2 will be set out in a subsequent guidance document. The GLA's Energy Assessment Guidance document was issued in 2022. This defines 'major refurbishment' as 'those with a floorspace of over 1,000sqm'. The former cinema and Squash Courts have a combined area of less than 1,000sqm and thus a full energy assessment, with emission calculations is not required. The guidance also recognises that Part L of the Approved Documents of the Building Regulations allows for flexibility in meeting recommended standards due to potential restrictions to building work upgrades, in relation to buildings which have listed building status or heritage projects. Further details regarding Part L of the Approved Documents are set out in Section 4.

3.3 The refurbishment will be to a 'shell only' specification and due to the listed status of the cinema building, opportunities for overheating mitigation are limited to the fit-out specification. As per the GLA's Energy Assessment Guidance, it is argued that a TM52 assessment should not be undertaken because '*opportunities for reducing cooling demands via passive means are constrained'.* Nonetheless, the refurbishment of the Former Cinema Building will be completed in line with the London Plan cooling hierarchy, minimising the requirement for any cooling demand by prioritising passive measures for overheating mitigation.

3.4 The following London Plan policies are considered relevant to the development proposals in the context of wider sustainability:

- Policy SI5 Water Infrastructure states that in order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner. Commercial development should achieve at least the BREEAM excellent standard for the 'Wat 01' category.
- Policy HC1 Heritage Conservation and Growth requires development proposals to avoid harm to heritage assets and conserve their significance.
- Policy SI7 Reducing Waste and Supporting the Circular Economy states that referable applications should promote circular economy outcomes and aim to be net zero-waste.

Local Planning Policy & Guidance

3.5 The following London Borough of Hillingdon (LBH) Local Plan Part 2 (LPP2) (2020) relate to heritage assets and energy and sustainability matters:

- Policy DMHB1 & Policy DMHB2. These policies require:
    - The significance of a heritage asset be enhanced unless justified by public benefit.

- Any alterations to respect heritage character and consider climate change and renewable energy where it would not impact negatively on the asset.
- Any alterations to maintain significance and respect historic fabric.
- Any additions to be sympathetic in scale, design and materials.

- Policy DMEI2 requires development to minimise carbon emissions.
- Policy DMEI3 requires development to connect to decentralised energy networks unless the connection is not reasonably possible.
- Policy DMEI 7 Biodiversity Protection and Enhancement requires the design and layout of new development to retain and enhance any existing features of biodiversity or geological value within the site.
- Policy DMEI 10 Water Management, Efficiency and Quality states that developments should be drained by a SuDs system and must include appropriate methods to avoid pollution of the water environment. Preference should be given to utilising the drainage options in the SuDS hierarchy which remove the key pollutants that hinder improving water quality in Hillingdon. All new development proposals (including refurbishments and conversions) will be required to include water efficiency measures, including the collection and reuse of rain water and grey water.

4. BUILDING REGULATIONS

4.1 Part L of the Building Regulations aims to reduce the energy consumption of buildings. Approved Document L2 (Part L2) of the Building Regulations pertains to buildings other than dwellings. Part L2 includes exemptions for listed buildings. Paragraph 0.12 states that works to listed building do not need to fully comply with energy efficiency requirements where compliance would unacceptably alter the building's character or appearance. The former cinema building is a Grade II listed building and therefore is not required to demonstrate full compliance with energy efficiency matters due to the impact this could have on the historic fabric of the building, the effect on the buildings significance, and genuine space and management constraints related to managing a listed asset. Paragraph 0.14 notes that the 'energy efficiency historic and traditional buildings should be improved only if doing so will not cause long-term deterioration of the building's fabric or fittings'. In particular, this applies to historic and traditional buildings with a vapour permeable construction that both absorbs moisture and readily allow moisture to evaporate. The former Cinema building has lime render present and replacement lime render is proposed to ensure consistency in appearance.

4.2 In addition to the listed status of the building, the size of the building is less than 1,000sqm. Section 12 of Part L2 confirms that consequential improvements, to improve the overall energy efficiency of existing buildings should be undertaken in relation to buildings where the 'total useful floor area' is

over 1,000sqm. The total floor area and thus the total useful floor area of the former Cinema is less than 1,000sqm.

5. PROPOSED ENERGY EFFICIENCY MEASURES

5.1 The proposed scheme incorporates the following energy efficiency measures where possible, in the context of the listed status and usable area size discussed above:

- Replace existing high-level single glazed, Crittall windows with double glazed Crittall windows in the Main Hall;
- Provision of double glazed windows and doors;
- Re-provision of lime plaster;
- Provision of a concrete floor in the Main Hall and former Squash Courts;
- Efficient mechanical heating and cooling system;
- Provision of a new roof in the former Squash Courts;
- Energy efficient lighting;
- Maximisation of natural daylight in the former Squash Courts.

5.2 The following provides an overview of the proposed energy efficiency measures and the associated benefits:

- **Replace existing single glazed, Crittall windows with double glazed Crittall windows.** The existing single glazed, high-level, Crittall windows in the Main Hall are in a state of disrepair with numerous glazed windowpanes missing. The proposed scheme will replace the high-level windows in the Main Hall, with double glazed Crittall windows. The replacement windows will provide the following energy efficiency benefits:
  - ***Improved Thermal Performance:*** The proposed double glazed Crittall windows will provide better insulation than the original single glazed windows. This will reduce heat loss during the winter months and improve the thermal comfort within the building, without being detrimental to the building's historic use of lime plaster construction. This could lead to potential energy savings.
  - ***Reduced Heat Transfer:*** The proposed double glazed Crittall windows will improve the thermal resistivity of the barrier between the interior and exterior environment, reducing heat transfer through the windows. This will minimise heat gain in summer months and

heat loss in winter months, resulting in a more energy efficient building that requires less heating and cooling to maintain comfortable internal conditions.

- ***Enhanced Air Tightness:*** The window replacement will provide an opportunity to improve standard of air tightness of the window, helping reduce drafts and air leakage. This will improve the overall energy efficiency of the building envelope by preventing conditioned air from escaping and external air from infiltrating the interior space, leading to lower energy consumption for heating and cooling.

- ***Sound Installation:*** The installation of the double glazed Crittall windows in the Main Hall will provide better sound insulation when compared to the original single glazed windows. This will reduce noise transmission between the internal and external environments.

- ***Preservation of Historic Fabric:*** While enhancing the energy efficiency of the building, the proposed double glazed Crittall windows will be installed within the existing openings in the Main Hall and will not require any removal of the historic wall fabric. They will replace the current windows which are in a state of disrepair and detract from the character of the appearance. The proposed double glazed Crittall windows will match the appearance of the original single glazed windows, which will ensure the building retains its architectural integrity and heritage value.

- **Provision of Double Glazed Windows & Doors.** The proposed scheme incorporates double glazed windows where new windows are proposed in relation to the former Squash Courts. The double glazed windows and doors will have the same energy efficiency benefits as the high-level Crittall windows.

- **Re-Provision of Lime Plaster.** The scheme proposes the re-provision of lime plaster where it has been historically present within the building. The use of lime plaster will provide the following energy efficiency benefits:

  - ***Natural Insulation Properties:*** Lime plaster has inherent thermal properties that contribute to building insulation. It can absorb, store and release heat slowly to help regulate internal temperatures.

  - ***Breathability and Moisture Regulation:*** Lime plaster is permeable to moisture vapor, allowing buildings to 'breathe' and regulate humidity levels effectively. This breathability helps to prevent moisture build up within the walls, reducing risk of mould growth and structural issues.

  - ***Durability and Longevity:*** Lime plaster is durable and has a long life span. The longevity of the material reduces the need for frequent repairs and reduces energy need and resources associated with building upkeep.

- ***Versatility and Aesthetics:*** The appearance of the lime plaster will reflect the historic appearance and style of the building.

- **Concrete Floor to Main Hall and Former Squash Courts.** The introduction of a new concrete floor will offer the following energy efficiency benefits:

  - **Reduced Heat Loss:** Concrete floors have inherently high thermal mass, meaning they can absorb, store, and release heat effectively. By installing a new concrete floor with appropriate insulation, the building's thermal performance will be improved. This will help to maintain a more stable indoor temperature.

  - **Improved Thermal Performance:** The use of a concrete floor will provide better insulation when compared to a suspended floor. The insulated concrete floor serves as a barrier to heat flow, helping to minimise thermal bridging and air leakage. Particular attention will be paid to the edge sealing to ensure a continuous layer of insulation is present. This will result in a reduced energy demand for the space.

  - **Enhanced Air Quality:** Concrete is non-porous and resistant to moisture, mould and allergens, contributing to better indoor air quality.

  - **Durability and Longevity:** Concrete is known for its durability and longevity, requiring minimal maintenance and repair. The use of concrete will ensure that floor can appropriately accommodate the proposed building uses (gym and café).

- **Mechanical heating and cooling system.** The proposed mechanical heating and cooling system incorporates external condenser units, grilles, air handling units and mounted diffusers. These elements will work together to heat and cool the internal areas. This system has been proposed to be energy efficient, utilising modern design to maximise occupant comfort whilst ensuring minimal structural impact to the retained building.

- **Roof Covering to Former Squash Courts.** A new flat roof will be installed over the former Squash Courts. This will include adequate insulation to meet Building Regulations for an element of new construction.

- **Energy Efficient Lighting.** The use of energy efficient lighting in the building will offer the following energy efficiency benefits:

  - **Reduced Energy Consumption:** Energy efficient lighting consumes significantly less energy than traditional bulbs and will reduce the building’s overall energy consumption.

  - **Longer Lifespan:** Energy efficient lighting has a longer lifespan, which means the lighting will require less maintenance and interference with the historic building fabric.

  - **Improved Lighting Quality:** Energy efficient lighting can provide a better light quality and enhance the visual atmosphere within the building.

- **Enhanced Preservation of Building Interior:** Energy efficient lighting emits minimal heat and UV radiation, which makes it suitable for illuminating the historic interior of the building as it prevents colour fading.

- **Flexibility and Control:** Energy efficient lighting allows for lighting levels to be adjusted to respond to building / room occupancy, daylight availability and specific lighting needs. This flexibility enhances energy savings by ensure lights are used when and where needed, without comprising the usability and functionality of the building.

- **Enhanced Sustainability Credentials:** The use of energy efficient lighting has sustainability benefits as lower energy consumption, have a longer lifespan, reduced waste generation as they need to be replaced less frequently, emit less heat and are resource efficient.

- **Maximising Natural Daylight in Former Squash Courts.** The proposed scheme introduces four new openings within the former squash courts which will provide an element of glazing to maximise the natural daylight within the space. This decreases the reliance on artificial lighting and reduces the overall energy consumption of the space.

Renewable Energy

5.3 The listed status of the building sets a significant constraint which severely limits the potential of incorporating renewable energy into the proposed scheme. As such, the introduction of renewable energy technologies has been considered and discounted in relation to the refurbishment of the listed building. An assessment of the potential provision of PVs on the building has been undertaken and this has concluded that the installation of PVs, as a renewable energy source, would unacceptably alter the character and appearance of the listed building.

5.4 The provision of PV panels on the pitched Main Hall roof and pitched roofs associated with the front porch would detrimentally alter the building's visual appearance and architectural significance as a Grade II listed building.

5.5 The provision of PV panels on the later flat roof additions to the south and west elevations would detract from an appreciation of the architectural quality of the principal elevations and would be visually prominent in views of the building from the surrounding streetscape.

5.6 The proposed roof on the former Squash Courts would be an unfavourable option for PV panels, as it is north-facing and would receive little direct sunlight, particularly given its position immediately adjacent to the taller gable wall associated with the Main Hall. The proposed roof has been designed sensitively to integrate with the existing walls and closely reflect the appearance and height of the previous structure. A tall parapet to visually conceal PVs on the roof would have limited effect due to the building's orientation, and is therefore not considered to be a sympathetic design solution.

5.7 The exclusion of PV panels from the proposed scheme is not only warranted but imperative to preserve the historical significance and visual appeal of the listed building.

6. SUSTAINABILITY

6.1 The following key sustainability features have been incorporated in relation to the proposals for the reinstatement of the gym use and provision of a café space within the former Cinema building:

> ***Retention and Re-Use of an Existing Building:*** This aligns with the overarching principles of environmental, social and economic sustainability. It minimises the need for new building materials and has a lower environmental impact when compared to new construction as it avoids extensive embodied energy and carbon emissions associated with new build development. The approach also ensures the retention of a listed building of heritage significance.

> ***Energy Efficiency Measures:*** Energy efficiency measures have been carefully considered and implemented into the scheme where possible. Each measure serves to improve the energy performance of the building whilst ensuring the heritage asset and its significance are retained.

> ***Electric Vehicle Charging Facilities:*** The realigned car park area will be served by electric charging facilities. 20% of spaces (no. 5) will be served by electric vehicle charging points.

> ***Waste and Recycling Facilities:*** Adequate facilities for operational and construction waste, including segregated bins, will be provided.

> ***Safety and Security*:** The building has been vacant for a prolonged period and the re-use of building will provide an active use on the site. This will create a safer, more secure environment.

> ***Inclusive Access**:* The building has historically been inaccessible for those with reduced mobility. The proposed scheme will provide new ramped entrances to the building and ensure level access is obtainable to all the ground floor areas within the building.

> ***Sustainable Accessibility:*** The building and surrounding public realm will accommodate long and short stay cycle parking. Long stay cycle parking for staff will be accommodated within the building footprint and short stay cycle parking for visitors to the building will be accommodated close to the building's entrances in the public realm.

> ***Biodiversity and Ecology:*** The landscape surrounding the building will be enhanced and additional landscaped areas will be provided. Tree and shrub planting will also be provided. Sustainable drainage systems (SuDs) will be incorporated within the scheme to the south of the building. The landscape and SuDs will enhance biodiversity and ecology.

> ***Water Usage:*** Internal water usage will be reduced through the use of flow control devices and water efficient fixtures and fittings.

7. WHOLE LIFE CYCLE CARBON EMISSIONS

7.1 Whole Life Cycle Carbon Emissions are the total carbon emissions resulting from the construction and the use of a building over its entire life, including its demolition and disposal. Embodied Carbon emissions are the emissions associated with raw material extraction, the manufacture and transport of building materials, and construction; and the emissions associated with maintenance, repair, and replacement, as well as dismantling, demolition and eventual material disposal.

7.2 As the impacts of the proposed energy efficiency measures for the proposed development have been discussed within the Section 5 of this Technical Note, the following discussion pertains only to the embodied carbon emissions and does not include discussion of the operational energy performance. As such, the below refers to the embodied carbon emissions of the proposed retrofit.

7.3 Modules A1-A3 (material extraction and manufacturing) comprise the largest portion of a building's embodied carbon emissions. Retrofitting the existing building reduces the use of virgin materials. It is expected that the refurbishment of the existing building could reduce A1-A3 emissions between 40-45%. The following will be reused and therefore not required to be provided as new:

> Concrete and reinforcement steel within the substructure;

> Concrete, reinforcement steel, and blockwork within the superstructure;

> Brickwork that comprises the façade (though repair to brickwork is to take place);

> Roof coverings (which were recently installed as part of emergency works).

7.4 In addition to reducing A1-A3 emissions, retention will also reduce A4 (transportation) and A5 (construction site impacts including wastage) emissions. By reducing the amount of material that needs to be taken to site, transport emissions will be reduced and the wastage from the existing materials will be minimal. These measures will ensure that A1-A5 emissions have been significantly reduced.

7.5 Module B emissions refer to the repair, maintenance and replacement of materials. The majority of these emissions arise from MEP that is installed in the proposed refurbishment. While there is less ability to influence these emissions during the operational phase of the development, it is recommended that MEP equipment with longer lifespans is selected so as to reduce these emissions as far as possible.

7.6 Module C emissions refer to the 'end of life' of the building. By extending the lifespan of the building through refurbishment, this has the potential to maximise the end of life disposal of the building materials as it is expected that recycling technology will improve with time.

7.7 In order to balance the need to improve the energy efficiency of the proposed refurbishment, the new double glazed windows and lime plaster, which has natural insulation properties, will be provided. The extensive retention of the existing building elements will ensure that A-C emissions are reduced as far as practicable.

8. CIRCULAR ECONOMY

8.1 The Circular Economy is defined in the London Plan as '… one where materials are retained in use at the highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste.' This is in contrast to the current linear model, in which materials are mined, manufactured, and disposed of. The Greater London Authority has released a 'decision tree' which provides a framework on how the design can be approached for existing buildings. The decision tree and the responses in relation to the proposals for the former cinema building are outlined in red in Figure 1 below.

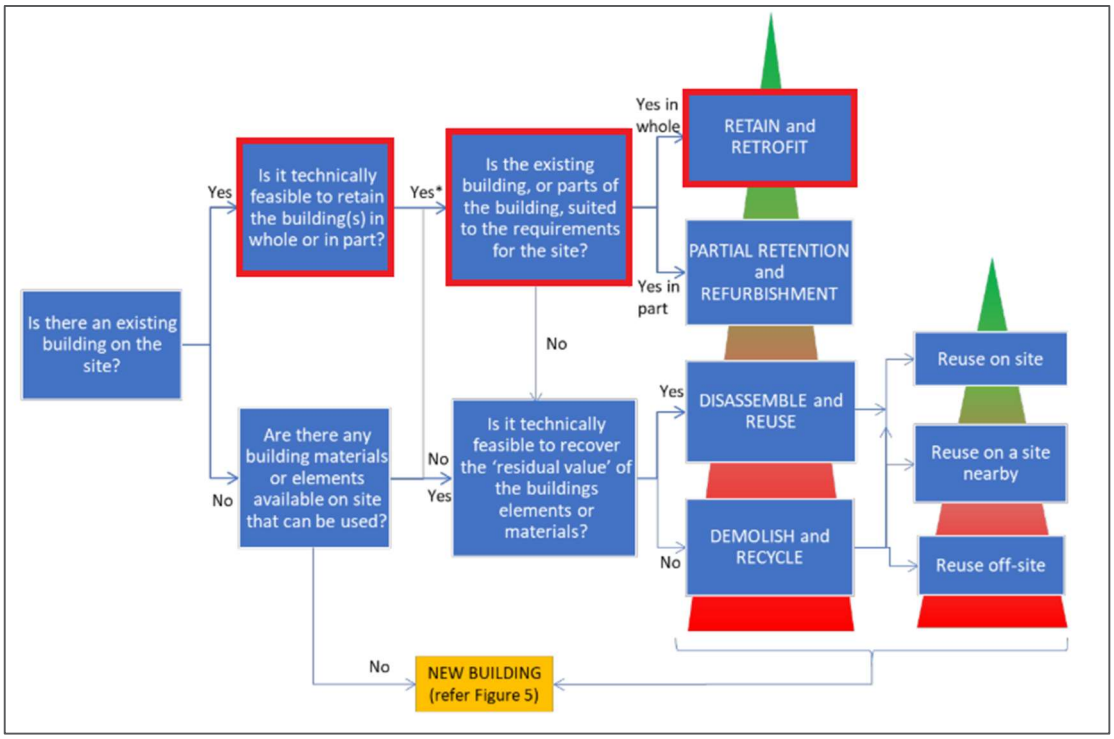

Figure 1: GLA Existing Building Decision Tree

8.2 By retaining the existing building, as opposed to demolishing and rebuilding, it helps maximises the building's circularity. One Click LCA is a Building Life Cycle software, which can be used for both whole life cycle carbon emissions assessments and building circularity assessments.

8.3 The building's circularity is evaluated in terms of the mass of the recovered building material as compared to virgin materials likely to be used in the building construction and the percentage of the material that can be returned to building construction at the end of life of the building. This is represented as percentage. For a standard 'business as usual' development, a building circularity score of between 20-30% would be expected, if no materials on site are to be retained. For a retention and retrofit project, a building circularity score of 55-65% can be expected. This is due to the fact that retaining materials in their entirety is the scenario that maximises the value of the material.

8.4 As such, it can be concluded that retention and retrofit as opposed to demolition and rebuild is significantly better in terms of supporting the Circular Economy.

9. SUMMARY AND CONCLUSION

9.1 The proposed scheme seeks to achieve a sustainable and sympathetic refurbishment that preserves the historical significance, character and appearance of the listed former Cinema building.

9.2 The listed status of the building and the scale and nature of the refurbishment works do not require a full and detailed assessment of energy emissions and efficiencies in accordance with planning policies, planning guidance and the requirements of Part L2 of the Building Regulations. Nevertheless, the energy efficiency of the building has been considered as part of the proposals to ensure the long-term sustainability of building and its successful operation as a gym and café. Energy efficiency measures and sustainability features have been sensitively selected to maximise sustainability whilst preserving the heritage asset.

9.3 The significant retention and reuse of the existing materials will reduce the overall embodied carbon emissions as well as support the principles of the Circular Economy.

9.4 In conclusion, the proposed high-quality, sustainable scheme will secure the long-term use of the building.