

**WHITE LION, PAILTON
SUSTAINABILITY STRATEGY**



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This Sustainability Strategy jointly prepared by Burrell Foley Fischer LLP Architects and ESDP Services Engineers acts as a companion to the Planning and Listed Building Consent Applications for the White Lion in Pailton, north-east Warwickshire. This report aims to explain the environmental principles which have informed the proposals.

1.0 Environmental aims of the project

In bringing this historic building back into use by the community, the Pailton White Lion Working Group and the design team are committed to following good environmental practice wherever possible. The proposals for the building refurbishment and the wider site focus on building sustainably and energy innovation through:

- Making best use of the existing historic building fabric to minimise the need for demolition or new construction.
- Using reclaimed materials or those from sustainable sources wherever possible
- Embracing opportunities for on-site energy generation.
- Reduce energy consumption through a more efficient heating system, improved insulation and the use of low consumption lighting and other fittings.
- Replacing existing hard surfaces around the building with grass to slow the flow of water through the site.

2.0 Mechanical, Electrical and Plumbing (MEP) services

The design seeks to provide an environment that is suitable for use by staff and visitors, that provides a low energy design to minimise in-use energy consumption of the building. It will meet, as a minimum, all statutory regulations regarding energy consumption and where practical, follow a fabric first principle. The design will minimise maintenance by using high quality materials and equipment, using simple reliable systems, and providing good maintenance access. Consideration has been made of more sustainable technologies for the central heat generating plant, and the agreed approach is for a new Air Source Heat Pump to serve the building, with an array of photovoltaic cells mounted on the two south-facing roof slopes to provide carbon-free electricity.

The main features of the MEP services included in the works include the following:

- Air source heat pumps for space heating and hot water production.
- Underfloor heating to the ground floor of the main building with radiators elsewhere and towel rails to en-suite bath/shower rooms.
- Central hot water storage served from the air source heat pumps.
- Mechanical ventilation to sanitary accommodation and kitchens.
- Internal and external lighting
- Power distribution for sub let units and main building.

2.1 Existing Site Services

The site is served by mains water, gas and electricity.

- The existing water service will be renewed
- The gas meter on the existing service has been removed. Confirmation is required that the service is now disconnected and can be removed.
- The incoming electrical supply runs underground and enters the building in the rear corner. There is an incoming electrical supply of 100A.

2.2 Sustainability Criteria

The overall design philosophy will be to adopt sustainable low energy and low carbon generating systems within the constraints of the building budget, site and constructional limitations. Energy demand will be minimised through design and use of efficient plant and energy conservation measures. All plant will be selected for maximum efficiency and controllability. The design will be developed to take account of economic, resource and environmental factors.

It is proposed that the design will include renewable energy technology to ensure that a minimum of 10% of the predicted building energy requirements are offset by renewable or low carbon sources.

It is proposed that appropriate design solutions will be developed to achieve the following:

- Reduction of CO₂ emissions by the use of heat pump technology.
- Reduction in electrical consumption by the provision of PV arrays.
- Sub-metering of substantial energy uses.
- Effective thermal zoning.
- Effective zoning of lighting installations.
- Minimisation of water consumption.

The MEP services will be designed to work together to maintain an energy efficient building at all times.

2.3 Proposed Mechanical Services

Incoming Utility Supplies

- New separately metered mains water supplies will be provided to the main building and each sub-let.

Internal Mechanical and Public Health Services

- Low energy consumption and a small carbon footprint shall be achieved by utilising high efficiency plant, variable speed drives, and intelligent control systems.
- Renewable energy will be provided by on-site generation of electricity from roof mounted Photovoltaic panels
- The following mechanical engineering services and systems are proposed:
 - a) Air source heat pumps to provide both heating and hot water.
 - b) Underfloor heating to ground floor and panel radiators to upper floors.
 - c) Local mechanical extract ventilation.
 - d) Kitchen ventilation
 - e) Domestic hot and cold water services extended to serve all outlets.
 - f) Above ground drainage

Heat Pump Heating

- A heat pump system shall be provided to the main building with an external unit located to the rear. A buffer vessel and ancillaries shall be provided in the adjacent room. Pipework will distribute at high level ground floor to serve underfloor heating at ground floor and radiators on upper floors. Consideration will be given to fan assisted radiators if required.
- Each room/emitter will be thermostatically controlled.

Mechanical Ventilation

- The public toilet areas will be provided with a ducted extract system and centralised toilet extract fan.
- Local extract fans will be provided to all sanitary accommodation and to the sub let kitchen facilities.
- Mechanical extract ventilation will be provided to the main kitchen to DW 172.

Domestic Hot and Cold Water

- The main building and sub-let units will each have a new metered mains cold water connection from the main in the road.
- The service to the main building will include a break tank/booster set to provide storage and mains separation in line with the Building Regulations and Water Regulations.
- Hot water will be provided from a storage cylinder with heat provided by the heat pump.
- Pipework will distribute to all outlets with check valves and anti-scald valves as required.

Automatic Controls

- Automatic time and temperature controls will provide centralised control and monitoring of all mechanical systems.
- All controls and devices necessary for the satisfactory, safe, energy efficient, time, temperature and isolation control of each service will be provided.
- Consideration may be given to the provision of a simple Building Energy Management System (BEMS).

Metering

Additional sub-metering of the electrical distribution to the main building will be provided to allow the user to determine electrical usage for the following key energy loads:-

- Heat pump systems
- Mechanical plantroom equipment
- Lighting
- Small Power

2.4 Proposed Electrical Services

New Incoming Utility Supplies, Service Diversions and Alterations

- The existing incoming electricity service is considered unsuitable for the proposed fit-out of the building, and will therefore need to be upgraded to facilitate the additional electrical load.
- New telecommunication and data connections will be required to the building,

Internal Electrical Services

The electrical engineering services shall be discrete and highly adaptive to the multi-functional use of the various spaces. Low energy consumption and a small carbon footprint shall be achieved by utilising low energy LED lighting throughout

The following electrical engineering services and systems are proposed:

- a) LV distribution, metering and containment
- b) Small power distribution
- c) Lighting and emergency lighting
- d) Communications
- e) Fire and security systems
- f) Disabled persons toilet alarm
- g) Mechanical controls wiring
- h) Access Control
- i) CCTV
- j) Intruder Alarm System
- k) External lighting
- l) Audio Visual system

LV Distribution, Metering and Containment

- The building will be provided with a new electrical supply, including provision of a new MCCB panel board and localised distribution boards at strategic locations.
- New distribution boards will be provided throughout
- All new and existing distribution equipment will be metered for lighting, power and substantial energy consuming equipment.
- New electrical tray and trunking containment systems will be provided to ensure protection and safe distribution of cabling systems.

Small Power Distribution

- Small power distribution from the local distribution boards will be via conventional trunking containment. This will either be run within ceiling voids or exposed to view where ceilings are not provided.

Lighting and Emergency Lighting

- Low energy LED lighting will be incorporated throughout.
- All new emergency lighting will be of the automatic self-test type that provide reports via email to the authorised person.
- External lighting will be photocell and time clock controlled.

Communications

- Category 6A data cabling infrastructure will be provided throughout for voice and data installations
- A disabled call alarm system will be provided to serve all disabled toilets and shower facilities.

Fire and Security

- The Fire alarm system will be category L1 to provide fire detection throughout
- CCTV systems shall be integrated to provide building and occupant security in line with Client requirements.
- Access Controls shall be provided in line with Client requirements.

Mechanical Controls Wiring

- Power and controls wiring and containment shall be provided between control panels and mechanical equipment and control devices throughout the building.

Lightning Protection, Earthing and Bonding

- A lightning protection system will be provided subject to assessment.
- Earthing and bonding shall be provided in accordance with industry guidance to ensure electrical safety to the building and occupants.

Audio Visual Systems

- Audio visual systems to be provided by the Client will be reviewed during design to ensure that power and audio visual cabling requirements are included as part of the electrical installations.
- Fixed HDMI outlets and cabling shall be provided in line with Client requirements.

External Lighting

- External lighting shall be provided via photocell and presence detection.

Testing and Commissioning

- All electrical systems will be fully tested and commissioned to industry standards, Regulations and Codes of Practice.
- Operating and Maintenance Manuals, As-fitted Record Drawings, Building Log Book and test and commissioning data will be provided.

2.5 External Services

The following external mechanical and public health engineering services and systems are proposed:

- Frost protected external bib taps for general site maintenance purposes.

The following external electrical engineering services and systems are proposed:

- LV power distribution to vehicle charging points (to serve any future requirement)
- LV power distribution to external mechanical equipment
- LV power distribution to security and access control equipment as required.

2.5 Plant Space and Services Distribution

Plantroom space has been identified to accommodate heat pump buffer vessel and ancillaries, cold water break tank/booster set and hot water cylinder. Pipework services distribution has been identified on the drawings, routes are subject to design development and co-ordination.



3.0 Other Sustainability Measures

3.1 Biodiversity

The existing hard surfaces in front of the pub building will be relandscaped as grassed and planted areas, while to the rear, a larger grassed area will replace existing tarmac. Both of these measures will help to slow the passage of water through the site and reduce surface run-off. The proposed rear community garden will encourage greater eco-diversity by introducing habitats for wildlife, such as bee hotels.

There is widespread commitment within the community to improve the White Lion site, and as such, a team of local volunteers will be undertaking much of the upkeep of the landscape, ensuring this is maintained for the benefit of the village.

3.2 Health & Wellbeing

People spend up to 90% of their lives indoors, so the impact that buildings have on the health and wellbeing of their occupants is highly important. The project aims to provide an improved environment with positive impacts on health and wellbeing to those using the site and its facilities.

Improvements will include:

- Well-lit interiors
- Improved natural ventilation – windows will be repaired or replaced to ensure these are fully operational, while the removal of the existing kitchen block at the rear of the site allows for larger openings from the dining space onto the rear terrace.
- Using mechanical ventilation to improve air quality in appropriate areas, such as bathrooms and the kitchen.
- The creation of new landscaped gardens at the front and rear of the building for the benefit of all building users.
- New windows and rooflights to the first floor of the Brewhouse to provide natural daylight to the Enterprise space.
- A large new window to the ground floor of the Brewhouse to provide light into and views out of the shop.

3.3 Transport

The transport of people is noted as being the second largest emitter of CO₂ in the UK, and is therefore a priority area in achieving the UK's net zero carbon target.

The following measures are proposed:

- While the village location means that options for reaching the White Lion by public transport are limited, bringing it back into use as a community hub will in itself reduce car journeys by providing services to local residents without the need to go further afield.
- New cycle parking is proposed as part of the scheme.
- The measures taken within the project to improve accessibility will allow visitors that use wheelchairs, scooters or buggies to access the site more easily.
- The new enterprise space on the first floor of the Brewhouse provides local businesses with office accommodation with a minimised commute.

3.4 Water

The team recognises that the effects of climate change are placing increasing pressure on the water supply in the UK, with increased occurrences and severity of droughts. The energy and carbon emissions associated with the treatment of fresh water means water conservation should be a priority.

The project will endeavour to:

- Specify water efficient fixtures and fittings throughout the refurbishment.
- Utilise metering and sub metering of consumption to enable ongoing and targeted reductions in water usage.
- Install leak detection and shut off to help to prevent any major or minor leaks internally and externally.

3.5 Specification of Materials

The project team recognises the importance of considering both the social and environmental impacts of any materials used. The issues surrounding sustainable refurbishment are perceived to be more of a challenge in heritage buildings where inherent restrictions can be much more pronounced because of the need to preserve the layout and appearance of the original building, and where materials and finishes must be chosen to match those used during the building's original construction. Working with existing buildings can present challenges and constraints linked to structure, materials, services and sometimes conservation or listing issues. Research has shown that over 60 per cent of embodied carbon emissions are associated with the sub structure, frame, upper floors and roof of a building. A 'deep' refurbishment should retain these elements, meaning on average, the carbon footprint of a refurbished building is half that of any newly-built replacement.

Some of the physical and functional constraints faced by the scheme are as follows:

- Limited options to improve thermal performance of windows and walls
- Ensuring breathability of traditional constructions
- Location and size of windows restricting daylight provision in some areas
- Opportunities to alter layout limited by historic features
- Restrictions to service and visitor access due to the existing site layout

The specification of materials is an area where refurbishment projects generally outperform new build projects from an environmental aspect. The reason for this is that most existing materials are retained, with very few new materials specified. Where replacement finishes and materials are used, these replacement materials tend to be similar materials to those used for the original construction which can have low impacts.

Proposed strategies:

- Reuse and Retain: by working with the existing fabric and limiting demolition / new construction, the project will minimise its carbon footprint.
- Recycle: look at reusing materials by dismantling and setting aside; where not possible to reuse on site, work with the Contractor to recycle arisings off site.
- Specify Green: look for sustainable procurement for products: FSC certification for timber; local procurement for materials; use of reclaimed materials such as bricks or recycled steel.
- Specify for longevity – robust finishes which will be easy and economic to maintain, as well as appropriate to the historic fabric.
- Optimise performance: take a Fabric First approach to maximise the thermal performance of the building through passive means where possible – insulation and natural ventilation.
- Specify for efficiency: use of new LED lighting and more energy-efficient fittings in the refurbishment.
- Decarbonise: specify to remove fossil fuels as much as possible – using electricity as the energy source.
- On Site Opportunities for energy generation: take a site wide approach to review opportunities for on-site energy generation - Air Source Heat Pumps and PV cells will be installed.
- Simple Controls: visible off switch, allow local control for heat, ventilation and lighting to reduce energy wastage in use.

3.6 Waste

- Construction projects and buildings/sites produce significant amounts of waste per year. Where possible, a reduction in site waste will be implemented and materials from demolition reused (i.e. to form the base for the new garden terrace).
- A Waste Management Plan will be implemented.
- Waste facilities that are appropriate and accessible will be provided, with staff and visitors encouraged to recycle waste.
- Opportunities for on-site composting of food waste are to be explored.

3.7 Pollution

- The project seeks to maintain the natural environment around it and protect biodiversity from pollution during the construction phase and beyond.
- Responsible construction practices will be put in place to minimise resource use and the impact of noise, dust and pollution.
- External lighting will be designed to minimise the impact of light pollution. Light fittings will be specified with a reduced light spill and controlled using timeclocks to limit unnecessary operation.
- Where possible, electrical items will be shut off when not in use.

