

Redevelopment of St Patrick's Hall

UPP / University of Reading

Reading Borough Council Sustainable Design Checklist

Revised Application November 2017

Management

1. Will guidance for the non technical building user be provided so they can understand and operate the building efficiently and understand how the design reduces the overall environmental impact of the building and raise environmental awareness?

The design of the buildings considers the need for robust, clear and simple operation of all systems by the student occupiers. The developer, operator and design team have considerable experience in the delivery of student accommodation and adopt systems that require very little or no input from students, yet will deliver high levels of environmental sustainability, reduce carbon emissions and client (student) satisfaction.

The development is proposed by University Partnerships Programme (UPP) in conjunction with the University of Reading. On completion, UPP will take responsibility for operation of the buildings for the foreseeable future. The day to day operation of the buildings is undertaken by University Partnerships Programme Residential Services Limited (UPPRSL) division of UPP. They are experts in the management of student accommodation with a portfolio of 30,000 rooms nationwide. The efficient operation of accommodation is a key consideration for UPPRSL and they bring experience and innovation to the operation of university estates to reduce environmental impact and utility costs. UPPRSL understand the issues specific to student operation and sustainability.

UPPRSL currently operate all student accommodation for the University of Reading. Their experience has informed the design of the buildings, including the requirements to meet their standards for operational procedure and process, environmental targets, and the specific needs and issues.

To raise environmental awareness amongst students, material is prepared for arrival packs which are issued to students prior to moving into their rooms. The packs explain the operation of student accessible systems (such as heating controls) and how the design has been developed to achieve a reduced environmental impact. The packs also advise on issues such as recycling and sustainable transport options.

The design of heating and ventilation systems (including window operation) has been developed based on over 15 years experience of student accommodation developments. The operation of these systems is clear and simple, with robust controls to prevent over-riding thermostatic controls.

The M+E systems allow for consumption monitoring, which allows the operators to finesse systems and advise students on behaviours that will reduce environmental impact.

2. What consideration has been given to resource use, energy consumption and pollution in terms of the construction site impacts?

The design seeks to limit traffic movements associated with construction by providing a balanced cut and fill across the site, eliminating the export of soil from site, which in turn reduces the sites direct carbon emissions.

The Programme sequence adopted during construction greatly reduces the risk of damage to finished work which in turn reduces the production of site waste.

The selection of building components will omit the requirement for traditional scaffolds, thereby promoting a safe system of working and minimise the number of operatives and lorry movements.

Electric plant will be used on site. Sir Robert Macalpine's (SRM) temporary electric scheme will make use of 12 volt systems, LED lighting and promote the use of battery operated tools in order to reduce the reliance on fossil fuel. All site lighting will be connected to 'time clocks' to conserve energy by switching off lighting strings out of hours.

SRM will implement a Green Transport Policy, Car Sharing and Cycle to Work policies.

SRM have invested in new energy efficient site cabins which will be used for the duration of the project.

The use of off-site manufacturing for key components, such as bathroom pods, will reduce the amount of traffic movements to the site, reduce wastage through the factory control of production and improve quality.

Wherever modular components are used (such as bricks or roof sheeting), the design will seek to minimise wastage by working to full modules.

Targets for energy use, CO2 arising from site operation and water use will be generated and monitored against throughout the construction to ensure that the site are aware of the need to reduce their consumption.

SRM will implement their ISO14001 Certified Environmental Management System, which includes the requirement for a bespoke Project Environmental Management Plan to manage environmental risks. Nuisance and pollution will be a main focus of this document and it will be audited with regular environmental surveillances.

3. Will site investigation and appropriate remedial action be undertaken?

A site investigation has already been undertaken and has been submitted with the application.

4. Will the community and stakeholders be involved in the design process encouraging flexibly designed buildings which cater for shared use with the local community?

Both the local community and stakeholders have been involved in the design process, as set out in the Statement of Community Involvement. Stakeholder concerns have been particularly concerned about the rental levels for the accommodation and the designs have sought to provide a range of types of accommodation with particular reference to affordable rents.

Whilst the site can be accessed by the public, the buildings are designed for use by the residents. However, it is likely that access to the proposed car club vehicle would be open to the wider community.

5. How has the building been designed to reduce the opportunity for and fear of crime?

With regard to the previously withdrawn application, a meeting has been held with the Thames Valley Police Crime Prevention and Design Advisor that informed the submitted proposals. Thames Valley Police were again consulted as part of this revised application.

Key concerns in relation to access and permeability into the site has been reviewed since the meeting and the site layout adjusted. Concerns about the absence of 'defensible space' by ground floor bedroom windows have been addressed by amended landscape details.

The site layout and building arrangements is designed to maximise the benefits of passive security, promoting a sense of belonging and ownership.

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Post-graduate and family accommodation is located at the periphery of the site. All site entrances are overlooked, with buildings opening onto, and living spaces overlooking, key routes. Mature students are best suited to living in these locations, being less vulnerable than first year under graduates. They also have the potential to act as formal and informal wardens to younger students, taking a greater responsibility for behaviour at the point of interface with the public.

The majority of undergraduate accommodation is located in the centre of the site in two courtyards. Access points into the courtyards and key pedestrian junctions are overlooked by kitchen / living spaces – the most active rooms on the site. All entrances to living accommodation come from the centre of the courtyards.

The site reception and security area is located in the centre of the site with a good overview of routes into and around the site. 24 security patrols and CCTV will be employed and will help reduce the opportunity for and fear of crime.

Buildings will have PAS24 (or equivalent) doors and locks to building and flat entrances. The majority of cycle parking spaces are secure and fully enclosed.

A secure night time route into the site is promoted from the North of the site. This is overlooked by staff accommodation and will be lit and designed to create a sense of security for students returning to the accommodation late at night.

The students will receive arrivals packs in advance of coming to university, presenting the opportunity to advise students about how to stay safe and protect their property while they enjoy their time at University.

A meeting has been held with Thames Valley Police have been contacted to review the proposals from crime prevention and secure by design perspective.

6. What consideration has been given to the maintenance of the building?

The development is proposed by University Partnerships Programme (UPP) in conjunction with the University of Reading. On completion, UPP will take responsibility for operation of the buildings for the foreseeable future. It is in their interests to design robust buildings that are simple to maintain.

The day to day operation of the buildings is undertaken by UPPRSL, as explained under question 1. The maintenance of accommodation is a key consideration for UPPRSL and they bring vast experience of similar projects to the evolution of the design brief and scheme development.

UPPRSL have been involved in the design and specification of the project working closely with the design team and principal designer to ensure that the design is robust and the development can be maintained easily and safely.

As part of the handover process:

- Buildings are completed early to allow a smooth handover and a defined period for commissioning and training prior to student arrival.

- Full Operation and Maintenance Manuals are prepared by the design team, contractor and specialist suppliers and provided to operational staff in a timely manner.

Health and Wellbeing

7. Has the development been designed to ensure users have sufficient daylight, an external view, adequate and appropriate lighting, ventilation, air quality and drinking water?

Sufficient daylight and an external view:

The average daylight level analysis has been calculated for four 'worst case' bedrooms all north facing and looking into courtyards (bedrooms A2.1.01, B1.G.08, B2.G.01 and H1.1.04). The study also includes for two 'worst case' typical kitchens/living/dining areas (H1.G.K and E1.G.K) This initial study indicates that the assessed bedrooms achieve good average daylight factor and uniformity ratio, with values also being in line with the BREEAM 2014 New Construction Hea 01 Daylighting criteria requirements.

Adequate and appropriate lighting:

Internal lighting in all relevant areas of the building will be designed to provide an illuminance (lux) level in accordance with industry/BREEAM standards, including SLL Code for Lighting 2012.

Ventilation: Mechanical ventilation is only proposed where required to comply with Bdg Regs, i.e. kitchen hood extract, shower pod extract, etc.

The buildings are predominantly naturally ventilated, by openable windows (these are selected by Willmore lles and need to accord to Part F of the Bdg Regs.

Air quality:

Based on the BREEAM NC 2014 Pre-Assessment Estimator the intent is for the Design Team to complete an Indoor Air Quality Plan which will demonstrate minimisation of indoor air pollution during occupation of the building.

Drinking water:

Potable cold water will be provided to all cold water outlets within the buildings.

Energy

8. How has the building been designed to minimise CO₂ emissions associated with their operational energy consumption?

As mentioned in the Energy Statement, for minimising the energy consumption and subsequent carbon emissions, the following options/technologies are to be incorporated within the scheme:

Passive Options

- Increased thermal insulation
- Low air infiltration losses
- High levels of natural daylight
- Maximise the use of natural ventilation

Good Practice Energy Saving Technologies

- Low NOx, high efficiency condensing gas fired boilers/water heaters
- Inverter driven motors, for variable power output matched to actual usage (not on/off)
- Comprehensive sub-metering facilities
- Water flowrate regulation
- Energy saving high efficiency light fittings and lamps
- Lighting controls incorporating presence and daylight linking
- Low energy LED lamp technology to reduce energy usage
- Comprehensive Building Management Systems for control and monitoring

Low Zero Carbon Technology

- Combined Heat & Power (CHP)

9. How has the development been designed to optimise the use of energy from the sun, natural daylighting and controlled natural ventilation?

The site layout, design brief and repetitive nature of the accommodation type offers limited opportunities to orientate all bedrooms to optimal locations and achieve an effective use of land. The proposals have been thermally modelled to ensure that orientation does not cause overheating of habitable rooms, and that natural ventilation will be effective. Natural ventilation will be employed throughout the development. All windows to habitable rooms are openable but restricted for security and student safety reasons. The restrictors to windows have been selected to ensure that the windows achieve the 'free air' requirements essential for providing fresh air entirely via natural ventilation, in line with BREEAM guidance. In addition to the high volume purge ventilation, windows provide background ventilation in line Building Regulations Part F.

An initial planning pre-assessment indicated that day lighting to habitable rooms accords with good practice daylight factors as defined by the BRE and achieves the criteria set within the BREEAM guidance for daylighting and visual comfort. The design also accords with the BREEAM guidance for 'view-out' and visual comfort. For non standard accommodation such as refectories, cafes and social facilities the design has carefully considered sun and day-lighting and uses sun shading where appropriate.

10. How will the design of the building make efficient use of energy? (E.g. use of thermally massive materials, levels of insulation and use of green/brown roofs etc.)

Refer to the Energy Statement, where in accordance with UPP Sustainable Design Policy, the site development will incorporate increased thermal insulation on all building elements and achieve low air infiltration losses through good construction practices.

11. Have renewable energy sources or decentralised energy been considered for this development and if so, how would they be incorporated within the development?

A central boiler house, containing a combination of CHP and high efficiency gas fired combination boilers will supply the development with heat/hot water via buried pre-insulated pipework networking the site.

The CHP unit will generate electricity for the site while producing heat for the heating network, thus reducing carbon production.

Transport

12. How has the design and layout incorporated measures to reduce the need to travel, especially by car, and promote alternative and sustainable modes of transport, such as walking, cycling and the use of public transport?

The development has been entirely planned on the basis of use by sustainable modes of travel for all except special cases, as set out in the Transport Statement. A Travel Plan has been prepared to promote sustainable travel.

13. How have public transport networks been considered in terms of the location of the development and proximity to local amenities?

The location of the site within 5 minutes walk of frequent bus services and 10 minutes walk of the main university facilities was a fundamental consideration.

14. How have deliveries and the manoeuvring of delivery vehicles been considered?

The design has responded to the needs of a variety of delivery vehicles and waste collection vehicles, tracking details for which have been provided.

Water

15. How will the development incorporate the use of water saving devices to achieve maximum consumption of 5.5 cubic metres per year per person for office developments? (Or the most appropriate benchmark for other types of development).

Water flow regulation, low water use fittings and (where applicable) water shut off devices will be incorporated, to ensure the low water consumptions are obtained, to achieve the relevant BREEAM credits.

16. Will the development and access to and from it such as roads and paths be located away from areas of potential flooding?

Yes, none of the site or access to it is within an area at risk of flooding from rivers.

17. How will the development incorporate harvesting and re-use of rainwater?

Rainwater harvesting is proposed for grounds maintenance purposes using water butts.

Materials

18. How will the selected materials help to retain local character, ensure long life and ensure a low environmental impact?

There is a desire from all parties to respond to the local architectural character. Brick is the most common local building material and has been selected as the dominant facing material for the

development. In locations at the edge of the site, close to domestic scale neighbours, the proposals adopt a more domestic character with pitched tiled roofs.

Materials are selected using the BRE Guidance: The Green Guide to Specification. Where possible materials will be locally sourced, for example bricks are all sourced from the south of England.

19. What consideration has been given to reusing materials in-situ, responsibly sourcing materials and re-using existing structures?

Cut and fill will be maximised to reuse the site-won material, any existing structures and obstructions will be crushed to a specified grade in line with the WRAP aggregates quality protocol and reused.

SRM have an established supply chain who are able to deliver responsibly sourced materials and have a company target to responsibly source at least 80% of key building materials.

SRM will also, in addition to ensuring responsibly sourcing, during construction, use materials with a high content of recycled materials, for example:

- Insitu Concretes and concrete products containing pulverised fly ash;
- All timbers and timber sheeting products will be FSC or PEFC certified;
- Bricks burnt in kilns burning waste products as fuel; and
- Employing products with a high metal content ie:- metal frame, metal roof and wall cladding all with certification to BES6001.

Waste

20. Has an audit of the materials present on the site been conducted with an assessment of the extent to which materials could be re-used?

A formal pre-demolition audit has not yet been carried out. However, this will be undertaken prior to construction commencing. This will ensure that the recovery of materials from demolition for subsequent high grade / value applications is maximised. Through a desktop review of the scheme we expect the following materials to be present for salvage or re-cycling:-

- Timber, Joinery Doors etc;
- Roofing Tiles;
- Block Paving and Paving Slabs;
- Metal Roof Cladding;
- Industrial Catering Equipment;
- Metal inc: Copper Wiring, Copper and cast Iron Plumbing, Door Ironmongery;
- Metal handrails, balustradings and fire escape staircases; and
- The existing buildings will be crushed to make stone products for re-use in the permanent works.

As part of the Site Waste Management Plan (SWMP) an estimation of all waste will be required to be provided by the subcontractors. This in turn enables SRM to ensure review predicted waste quantities and reduce them, through either redesign, reuse or recycling.

21. How will the development make the maximum use of construction, demolition waste and recycled materials?

A Site Waste Management Plan (SWMP) will be implemented for the project in line with SRM's internal procedure. This will estimate all waste arisings on site and in turn enable them to ensure the most sustainable management option is adopted. For example, an estimation of the material arising from the existing building will be obtained. Once this quantity is known then a specification will be written to ensure that the material is made into a reusable product on site. For example, as hardcore under the ground floor slab of each block or backfilling to soft spots. The estimations provided by the subcontractors in our SWMP will inform the management of when waste streams are likely to occur, enabling the most effective means of management for the waste in line with the waste hierarchy.

SRM will also specify minimum recycled content for key materials on all the packages, which will be written into the contract clauses and included. Example of minimum recycled percentages include:

- Steelwork – 30%
- Concrete – 20%
- Brick / Block – 50%
- Drylining – 80%

Material reuse and recycled content will be monitored and reported monthly in line with our company sustainability reporting.

During the construction phase a waste management area will be established in a central location of the site. The compound will contain designated skips for:-

- Hard-core
- Plastics
- Metals
- Timber
- Bailer for Cardboard and Plastic Packaging
- Plasterboard

Subcontractors will be encouraged to re-cycle their waste into the bins provided. Clearly labelled, general rubbish, wood, plasterboard 1100 litre wheelie bins will be placed at the work face to be filled by the subcontractors. These bins will then be collected and deposited in the larger 40 yard skips in the re-cycling compound. These will be carefully packed and compacted to ensure that the skip is fully filled.

22. How will provision be made for the storage and recycling of waste for all users of the site?

Kitchens are provided with bins for general waste and three compartment recycling bins which allow separation of materials by students at source. Refuse and recycling is collected from shared kitchens by cleaning staff on the basis of three collections per week and delivered to the bin stores and deposited in 1100 litre Eurobins in allocated secure bin store. There will be 24 Eurobins on site, colour-coded to indicate refuse or recycled material.

Students are informed of the recycling strategy and waste collection plan in the greeting pack that they receive on moving into the residences. The message to recycle will be reinforced with information posters displayed in the communal kitchens detailing what packaging can be collected in the recyclable bags.

The bin stores have been located for convenience. The locations minimise heavy vehicle movements close to the busiest pedestrian areas.

At year end additional provisions will be made for the collection of waste and recycling, including the temporary installation of skips for waste. These will be placed at convenient locations close to block entrances.

Land Use and Ecology

23. How have the wildlife habitats and natural features on and adjacent to the site been considered and how will they be retained, protected and enhanced?

See the Ecological Impact Assessment accompanying the application.

24. What consideration has been given to not using previously undeveloped land?

The development is entirely on previously developed land.

25. What consideration has been given to the removal of contamination from the land?

The site investigation report concludes that contaminants exceeding threshold levels are relatively minor and this can be dealt with by encapsulation of material beneath buildings, hardstanding or clean soils.

Pollution

26. What measures have been incorporated to ensure that noise and light pollution plus pollution transported through surface water runoff will be minimised throughout the development?

Noise Pollution:

All mechanical plant to be specified/selected to meet CIBSE/Bdg Regulation requirements

Light Pollution:

See Response to 27

Surface Water Runoff:

The surface water drainage using attenuation storage through voided sub-base construction beneath paths and hardstandings will provide water quality benefits.

27. What measures have been incorporated to ensure that light pollution will be minimised throughout the development?

The external lighting strategy will be in accordance with BREEAM Pol 04 requirements for reducing night time pollution, pending planning/ ecological requirements for bats and wildlife.

In addition the external lighting strategy will comply to CIBSE/ILE requirements

28. What consideration has been given to reducing refrigerants and minimising nitrogen oxide emissions?

Refrigerants:

The majority of the development will be naturally ventilated through openable windows, generally avoiding mechanical cooling (with the exemption of IT hubs, cinema room).

Nitrogen Oxide:

Highly efficient, low NOx, condensing boilers will be incorporated.

29. How has the development been sited to minimise the impact of flooding?

The site is entirely within Flood Risk zone 1.

30. How has the design considered the use of sustainable drainage systems (SUDS) and how will they be incorporated within the development?

Yes, as set out in the Sustainable Drainage Statement. Soakaway testing confirmed that the infiltration capacity of the site was not adequate for the use of soakaways. The two ponds to the west of the site are attenuation features for the adjoining development which drain only a small percentage of the application site.

Calculations have established for the volume of water that will need to be stored on site in order to reduce discharge rates for the 100 year storm event making allowance for climate change and to allow for a reduction of 20% in run off rates.

It is proposed to attenuate flows by storing water within the site through voids in the sub-base beneath the proposed hardstandings in the courtyard and paths and through the use cellular storage below ground. This is shown on drawing BR1318-CUR-D-102

Innovation

31. What consideration has been given to innovative sustainability measures in terms of a procurement strategy, design feature, management process or technological development?

UPP have over 30,000 student bedrooms in operation, Willmore Iles Architects have built circa 13,500 student bedrooms over 15 years in the sector. The designs build upon a wealth of knowledge. The proposals at St Patrick's are part of a continual evolution of student accommodation.

The strategy of integrating client, operator and design team with a partnering contractor is innovative and results in an integrated design proposal of improved security of price. A shared Building Information Model helps with clash detection and modelling thermal properties.

The design proposals incorporate economy flats that have small rooms with shared facilities to achieve a budget offer. Although not an original approach this is unusual in the sector; where the drive has been to increase rental. This balanced approach to matching accommodation supply to demand is innovative.

Many innovative features of previously developed for UPP are incorporated into this project: pre-fabricated shower pods, reduced flow shower valves, pressed grp sheet shower enclosures.