

# **The University of Manchester Green Roof – Green Wall Policy & Guidance**

## **Addendum B: Green Roof – Green Wall, Campus Research Opportunities**

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## Addendum B: Green Roof – Green Wall, Campus Research Opportunities

This document is specific to research opportunities relating to green roofs and green walls at the University of Manchester, and should be read in conjunction with The University of Manchester Green Roof – Green Wall Policy and Guidance, dated December 2014.

There have already been several pieces of research that have incorporated green roofs or green walls undertaken by staff and students at The University of Manchester. For example Andrew Speak's work (2013) focused on the benefits of urban green roofs in Manchester. Speak found that green roofs:

- Act as filters for airborne particulates;
- Can aid in reducing high temperatures associated with the Urban Heat Island effect (UHI); and,
- Reduce surface water discharge in hard standing urban areas.

There are further research opportunities that the installation of green roofs and green walls on campus could provide, which would support the concept of the University's Living Lab (<http://universitylivinglab.org/>) and provide a means to support student experience.

It is thought by installing green roofs and engaging staff and students in research on these roofs, the value of these spaces will increase as a result of this engagement. These factors help to contribute towards creating a culture of environmental sustainability across campus.

Some of potential research opportunities are explored below:

- **Biodiversity Action Plans (BAPS)** - This line of research could investigate how accurately BAP habitats can be recreated on green roofs and how the creation of such habitats on green roofs links in with BAPs on the whole, for example in Manchester. Research could attempt to ascertain how many green roofs would be needed to support specific BAP priority species.
- **Campus insulation**- There is potential to analyse the reductions in campus energy costs as a result of green roof and green wall installation. A baseline would need to be established before the installation of any new green roofs or green walls so that effective comparisons can be made. Both the reductions in heating costs during winter and cooling costs in summer (if applicable) could be included in the study. The study could seek to ascertain at which point in time the energy savings costs would cover the cost of green roof or green wall installation.
- **Surface water discharge** – Work on this area of research would need to begin prior to any green roof or green wall installation. Alternatively a similar building could be used for comparative study but this will alter the accuracy of results. A study concerning surface water discharge would investigate the reduction in surface water discharge as a result of green roof or green wall installation.

- **Plant mixes-** Different mixes of plant species could be analysed in an attempt to discover which mixes provide optimum conditions for certain criteria. Providing that a green roof is big enough, different mixes can be investigated on one roof to ensure the same conditions. The different criteria that could be explored are the optimum plant mixes for:
  - evaporative cooling;
  - invertebrate biodiversity;
  - trapping particulates; and,
  - heat reflection – this area of research could also incorporate green walls and best planting specifications for insulation, air quality, biodiversity (scant)- seasonal.

The combination of plants in green walls could also be investigated to discover which combinations provide the best insulation and which plants have the biggest effect on air quality.

- **Surface water drainage charge-** This area of research would investigate the level of green roof and green wall installation (i.e. number of green roofs or green roof coverage in m<sup>2</sup>) that would lower the discharge band rating of the University campus. There is the potential to reduce the charges levied by United Utilities by reducing the amount of runoff water from the campus which enters the public drains and sewers. Green roofs and green walls have the ability to retain water and could lead to a reduction in a surface water treatment charge for the University. This could be investigated as part of the surface water discharge research or as a separate piece of work.

If you are interested in research opportunities specific to green walls and green roofs across campus, please contact a member of the Environmental Sustainability Team ([www.sustainability.manchester.ac.uk](http://www.sustainability.manchester.ac.uk), [es@manchester.ac.uk](mailto:es@manchester.ac.uk) or 0161 275 2240) who will direct you to the appropriate person/initiative.