

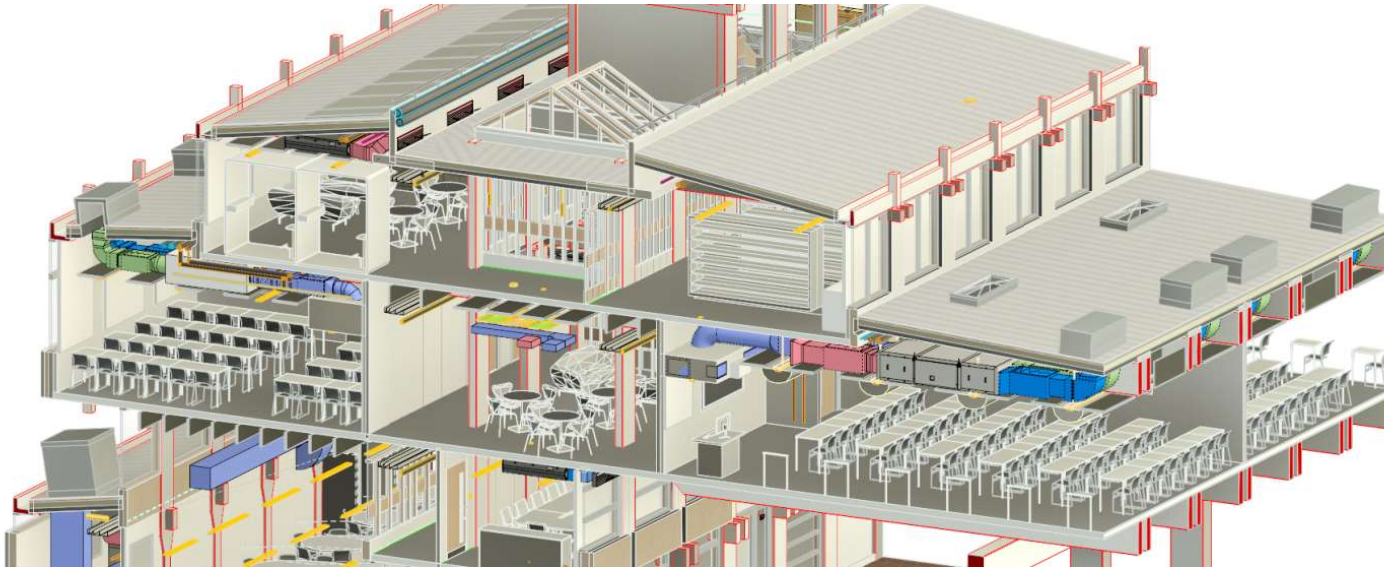
The following pages identify the outline scope of ventilation system works in connection with the refurbishment of the University of Reading's URS Building on the Whiteknights Campus.

Given the URS building has heritage value with a Grade II listing status it is implicit that the provision of all new M&E services needs to cause as little disruption as possible to the building fabric. Any new services will need to be sympathetic to their surroundings, and should not detract from the appearance of the building, its fabric or its contents. The ventilation system design therefore exploits existing plant spaces and voids rather than cutting in new wherever possible.

One of the key briefing requirements from the client is to provide good levels of comfort, ideally without resorting to the use of mechanical cooling, to the various teaching, office and ancillary spaces in the building, this with the understanding being that many of the spaces have historically overheated during the summertime.

Most normal teaching and office areas in the URS building are currently naturally ventilated via openable windows, apart from some small-scale local extracts for kitchenettes and WC facilities and full mechanical ventilation via central plant that has been provided for the lecture theatre spaces.

There are some limited areas where the existing natural ventilation openings are able to provide effective ventilation rates and comfort, these being primarily shallow plan spaces that are well shaded and/or on the North elevation. Unfortunately however, the availability and distribution of the natural ventilation openings is in many instances quite limited and therefore ineffective at providing adequate air flowrates, with many very deep plan spaces having only single side window openings provided. The façade on most elevations is highly glazed with limited external shading being provided, which results in the risk of overheating being high especially for the spaces on the Southern elevation.



*Cross section through the building showing typical arrangement of local MVHR units & ductwork at high level in the teaching spaces.*

For these spaces it has been confirmed, via dynamic thermal modelling of the building, that a natural ventilation strategy alone, which utilises only upgrades to the thermal performance of the existing façade, is unable to support the proposed occupancy of the building in most of the spaces without significant compromises on occupant comfort. On this basis the strategy has been to adopt a “mixed-mode” ventilation strategy. New mechanical ventilation units, with heat recovery as an energy efficiency measure (MVHR), will be provided throughout most of the building, this on the basis of a decentralised approach to minimise provision needed for new distribution routes. Due to the constraints imposed by the extensive high-level structure unfortunately this implies significant quantities of smaller ventilation units to achieve the required ventilation rates in each space.

Mechanical cooling will also be provided in some spaces that are more densely occupied and/or where equipment heat gains are also likely to be high, such as Lecture Theatres and Computer Labs, with central plant again being adopted for the former, with the original plant spaces and ductwork distribution routes being re-used where viable.

The URS building is currently supplied from the University's private HV network via their Blandford Substation W129 located nearby.

An initial electrical load assessment estimates the total load of the URS building in the region of 300-350kVA, and there would be sufficient spare capacity in the existing substation allocation to support this. Some modifications are proposed to the external low voltage infrastructure in order to supply the building directly from the nearby Substation, this in lieu of the existing supply which is via the switchgear in the University's Miller Building.

All the external cabling will therefore be replaced with new, this supplying the following in the building:-

- A new floor-standing LV switchboard provided within a dedicated room at ground floor level to supply most of the power requirements of the building.
- Two new evacuation lifts in the new staircores, which will be independently supplied to ensure resilience.

