

Project Name: Level 0&1 Mechanical Engineering

Location: Levels 0, 1, 2, 3 and 8, Mechanical Engineering Building

Project Number: MENGo803

BREEAM Target Rating: VERY GOOD



Project Description

This project makes up one of the sub projects for the South East Quadrant Programme. Project MENGo803 Level 0 & 1 Mechanical Engineering includes works on those levels and other areas namely the Thermofluids Laboratory 2 on levels 2 & 3 and works to the plant rooms on level 8 plus work to risers penetrating the intermediate floors.

This is the second phase of an overall redevelopment to provide state of the art research facilities for the Department of Mechanical Engineering and the Department of Aeronautics. A primary aim of the redevelopment is to allow both departments to enhance and improve research output for the future. It also allows for both departments to consolidate, collocate and upgrade their existing facilities. In addition to the provision of new research space there are new WC, showers and FM areas in line with current legislation and client policy requirements. Alongside the research spaces are teaching and support facilities. The key research and support spaces provided by this phase of the redevelopment are as listed below

Level 0

- Polymer Technology Laboratory
- High Temperature Testing Laboratory
- Thermal Mechanical Laboratory
- Dynamic Fracture & Forming Laboratory

Level 1

- Dynamic Fracture & Forming Laboratory Mezzanine
- Thermofluids Teaching Laboratory
- Steam Engines Room
- Internal Combustion Engine Room
- Boundary Layer Room

Level 1 cont.

- Research Divisional Workshops 1 & 2
- Assembly Room
- Metrology Laboratory
- Technicians Office
- Thermofluids Laboratory 1
- Polymers, adhesives and Composites Laboratory

Level 2

- Thermofluids Laboratory 2

All research areas due to the type of work being undertaken within them are constructed with robust material and appropriate finishes.

At the northern end of the building on level 1 there is an enhanced Faculty Goods In/Out facility which includes storage areas for materials, gases and fuels used by the researchers. This area feeds the whole building via the main corridor and existing adjacent goods lift. A new goods lift between levels 0, 1 and 2 has also been provided to ensure safe movement of materials, gases and liquid nitrogen within the new research areas.

The project has entailed an exhaustive strip out of redundant existing services and installation of new services within existing plant rooms on the floors and risers through the building, freeing up space for better utilisation where possible. On level 8, the existing plant room has been totally remodelled to retain existing plant for the rest of the building, fitted out with new plant required for this project and planned to leave vacant space for future developments in the vicinity.

Facts & Figures

Basic Building Cost £/m sq	£1,353.00 (Construction Cost)	External Works costs £/m sq	nil
Services Cost £/m sq	£1,623.00 (Construction Cost)		
Total area of the site in hectares	0.3370 ha	Area of Circulation in m sq	Circulation: 660m ² Stairs: 143m ² WCs, Showers: 106m ² Lobbies: 78m ²
Function areas and size in m sq	Lab NIA Lev 0: 685 m ² Lab NIA Lev 1: 1711 m ² Lab NIA Lev 2: 0 m ²	Area of Storage in m sq	Store NIA Lev 0: 69 m ² Store NIA Lev 1: 45 m ² Store NIA Lev 2: 0 m ²
Predicted Electricity Consumption in kWh/m sq	133.6 kWh/m sq/Yr	Predicted Water Use in m cubed/person/year	3.6m cu/person/yr
Predicted Fossil Fuel Consumption in kWh/m sq	167.2 kWh/m sq/Yr	% Predicted Water Use provided by rainwater harvesting	22%
Predicted Renewable Energy Consumption in kWh/m sq	nil		

Key Innovative and Low Impact Design Features

In line with the function of the laboratories as a specialised engineering facility they have been designed to ensure clusters of similar requirement and good adjacencies of these clusters allowing users more choice as to how to undertake their research projects. This also means that specialised service requirement are provided in the correct space only saving running costs. For instance activities that require close control temperatures are grouped in one room. The laboratories have been designed with robust finishes to meet the heavy duty nature of the work being undertaken within them. All doors have been made full height to assist in the moving of large equipment. To ensure flexibility within laboratories all services are exposed allowing easy access for future modification.

Construction Stage Environmental Impact Reduction

The steps taken by the contractor are responsible sourcing of materials wherever possible and implementation of a construction waste management plan which includes logging and separation of all recyclable materials.