Residential

NLG ASSOCIATES
BUILDING SERVICES DESIGN CONSULTANTS

Client	Berkeley Homes
Project	Royal Arsenal Riverside, Phase3, SE18
Architect	A and Q Partnership (London) Ltd
Value	£45m
Work Scope	252 residential units, commercial space & basement carpark

Background

Royal Arsenal Riverside is a mixed use development by Berkeley Homes (East Thames) Ltd (BHET), comprising 252 new build units. There is also 730m² of new build non-residential space at ground floor which will form a gym, pool and concierge and a basement carpark.

The Brief

Appointed as building services design engineers to carry out mechanical, electrical and public health services including covered carpark ventilation strategy by using CFD analysis. Providing energy strategy requirements for CO_2 emission reductions and energy efficiency to achieve CfSH 4. Providing a Thermal Model to assess building fabric options and Overheating Report, SBEM (Part L) / BRUKL Report for commercial space, SAP modelling assessment, and lodgement for residential apartments.

Challenges / Approach

The utility services around the site was very congested with limited space to route through with new utility services. The CHP thermal energy supply was not suitable for the development needs as was undersized and SSE only option was to supply the development with a new high pressure connection, which required careful co-ordination in a congested area.

To fully understand all utility services around the development and where physical connections could be made, we were required to translate the mapping surveys and convert them into sectional drawings to understand depths and gaps where new connections could be made to enter the site.

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Managing overheating - The London plan encourages the uptake of district heating in residential apartments, so corridors have been experiencing significant heat gains from the district heating distribution pipework.

Given a predetermined corridor design, the solution required CFD modelling the amount of air changes an hour and flow patterns in the corridors in order to predict the amount of ventilation and efficiency of the different strategies. We then defined and developed a strategy to reduce the heat gains in the corridors, demonstrating that the corridors would not overheat in accordance with CIBSE TM52.

Bin Store Ventilation - On previous phases of this development, the bin stores have been highlighted as a problem. NLG developed a ventilation strategy to reduce the possibility of maintenance and management issues and to provide a pleasant environment to dispose of household waste.

Two main scenarios we developed looked at intermittent smells from bins or constant smells, i.e. when a bin is opened and closed or when the bin is left ajar. The air quality was measured and in conjunction with a PIR to provide a comfortable environment to users. Monitoring the bin store air quality helps to detect the intermittent smells and reduces the amount of energy being used for the bin store ventilation.

With the aid of CFD modelling we were able to predict the efficiency of ventilation systems within the bin stores, to ensure there no stagnant areas for smells to accumulate. This with an air change strategy, allowed us to confidently predict that the bin stores are comfortable for people to use without exposure to smells from the bins.

Car park ventilation and air flow – the initial intention was for a naturally ventilated carpark but it was found that not enough vent area was available. With limited natural ventilation and to reduce the demand on the mechanical ventilation system, a mixed mode system is generally designed to operate at high speed during periods of high pollution, which are designed to adhere to the required acoustic parameters as dictated by the local planning conditions or environmental officer. The smoke ventilation strategy can also be incorporated into the car park ventilation system.

NLG Associates undertook the design of a mechanical ventilation system with limited natural ventilation to reduce the demand on the mechanical system. This mixed mode system was designed to operate at high speed during periods of high pollution which adhering tot the required acoustic parameters as dictated by the planning conditions.

CFD Models were also developed to predict the air flow of the ventilation system in the car park, ensuring that there were no stagnant areas or places where carbon monoxide could settle. This required specifying impulse fans to help the air circulate within the car park and mixed well with the outdoor air.

From the initial design, NLG Associates delivered a ventilation strategy that met the requirements of both building regulations and planning conditions.

In order to reach a standard of BIM Level 2 and collaborative working, the Car park was designed and developed in 3D Revit, bringing together mechanical, electrical, public health and structures disciplines.