

KEY FACTS

Project name: Lee Valley Athletics Centre

Location: Enfield, London, UK

Classification: New Non-domestic Building

Type: Sport and Leisure

Size: (GFA, NLA, project footprint): 9,700m²

Total Capital Cost: £16,000,000

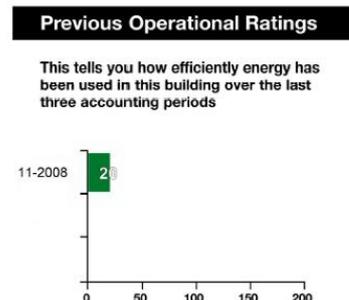
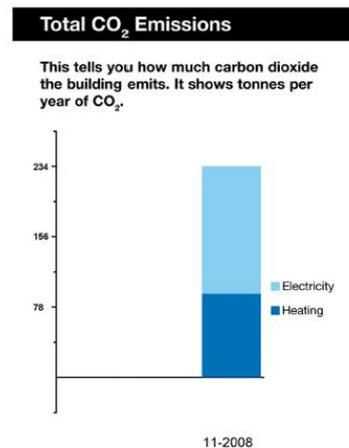
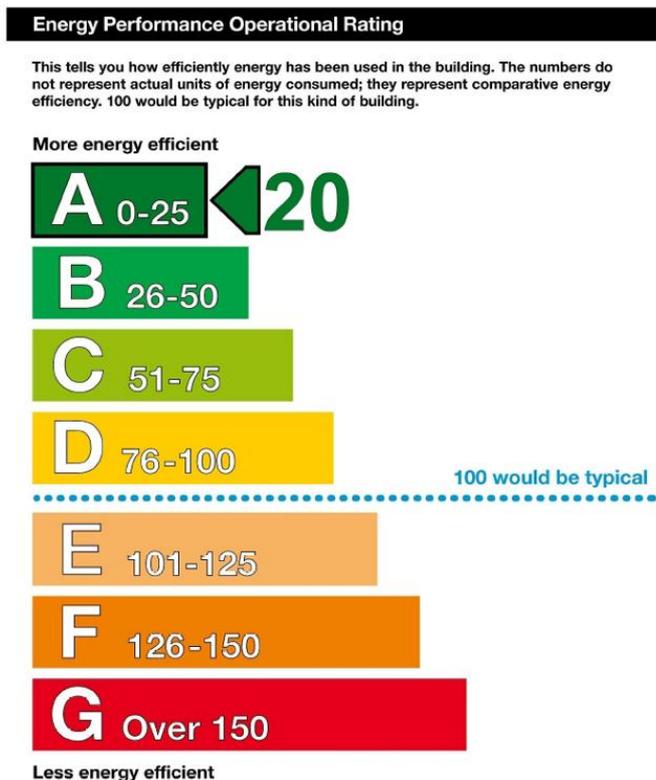
Client: Lee Valley Regional Park Authority



Project team details:

Architect	David Morley Architects
Structural Engineer	Buro Happold
Services Engineer	Max Fordham LLP
Landscape Architect	Livingston Eyre Associates
Quantity Surveyor	EC Harris
Contractor	Shepherd Construction
Project Manager	Drivers Jonas

Third party certification achieved: A Grade Display Energy Certificate



PROJECT SUMMARY

Whilst primarily for the training and development of elite athletes in the UK, the 9700sqm Lee Valley Athletics Centre, completed in 2007, is also home to the renowned Enfield & Haringey Athletics Club and serves the regional and local communities. Having every level of skill train in the same environment, the Centre encourages and inspires participation in athletics. The building incorporates a 200m indoor athletics track with permanent banking and a first floor sprint track with changing rooms and support facilities below. The Centre is a key training facility for the London 2012 Olympic Games.

The development seeks to enhance the special qualities of the site at Pickett's Lock and reflects the sustainability objectives of the Lee Valley Regional Park Authority. The entire building is naturally lit and ventilated, winning the RICS Sustainability Award 2010 on account of its actual in use energy performance.

ENVIRONMENTAL IMPACTS

Building orientation/site issues:

The development brings a disused brownfield site back into community use. The orientation and location of glazing maximises the use of daylight while minimising solar heat gain in summer. The glazing maximises public views into and through the building to the outdoor track creating a strong visual link between the inside and outside facilities. North lighting allows the facility to be evenly lit throughout daylight hours without turning on any artificial lights.

Transport:

The LVAC is accessible by public transport (nearest bus stop adjacent to the LVAC), cycling, walking and by car, with a designated drop-off point for the disabled. The bicycle stand is within the covered entrance area, which is well-lit and is linked visually with the reception area for added security. A north-south public right of way has been preserved and acts as a distinct routeway for pedestrians and cyclists through the site.

Energy Efficiency:

Passive design and engineering techniques are used to produce a low energy use facility through:
Natural ventilation and daylight;
High thermal mass walls and floors coupled with night ventilation and careful shading keep athletes cooler on hot days;
Best practice insulation;
North facing clerestory windows along the arched trusses provide good uniform daylight to the athletics hall and light level detector controls dim down or turn off artificial lighting when not needed. In 2009/10, after 6 months of data, energy use was 598,000 kWh (185 tonnes CO₂e), 15% less than 08/09.

Water Efficiency:

Low level water consumption is achieved through the use of water saving appliances such as low flush cisterns, timed spray taps for hand washing, showers, and infra-red electronic urinal flushing. External canopies reduce risk of water ingress and provide a recognisable feature on the buildings elevation.

CAMPAIGN FOR A SUSTAINABLE BUILT ENVIRONMENT

Materials:

All timber used was FSC certified and internal material finishes were selected for simplicity, longevity and low maintenance/ lifecycle impacts. The exposed thermal mass within the building attenuates temperature swings within the spaces. Structural steel used was minimised via a lightweight, highly insulated building envelope and the need for secondary steel was reduced through raked columns, longspan wall cladding, and reduced size of trusses.

Indoor environmental quality:

Sports areas are naturally cross ventilated. Windows along the east and west facades and at the top of the northlight ridges are automatically controlled to ensure the correct amount of ventilation at all times, satisfying air quality and temperature needs. Brise-soleil protects south facing glazing from summer solar gain and allows sunlight penetration in winter. The 200m track is cut into to the ground, reducing the building height by approximately 1.3 m, and eliminating unsightly guardrails creating a clean, uncluttered interior.

Operations and maintenance:

Decreasing energy figures are proof that the building facility managers understand how the building operates and also how to improve its efficiency through refining the way in which they manage the building systems. This is partly due to the well-managed handover and number of reviews and audits with the design team and external independent consultants, demonstrating the power and importance of post-occupation reviews and audits on reducing building energy consumption.

Waste reduction:

Built on what had been a municipal tip the building was designed on concrete piles to provide structural stability, should the contaminated soil shift, with under-slab ventilation for exhaust fumes from contaminated material. To the south part of the site the soil was levelled and then capped with clean topsoil, creating a safe environment. No spoil was removed from the site. This soil was landscaped to create informal spectating areas and a wind break around the outdoor 400m track.

Biodiversity:

The building and landscape were designed to provide habitats that enhance the existing area as well as a new habitat, where the building was able to do more than landscape alone could provide. The flat roof area over the first floor sprint track is developed as a 'brown' roof (crushed stone etc.) to provide a safe area for foraging where the black red-start can feed undisturbed.

OVERARCHING SUSTAINABILITY ACHIEVEMENTS

The Lee Valley Athletics Centre achieved an A-rating DEC certificate placing it in the top 1% of public buildings for energy efficiency. The design team worked with the aim of producing an exemplar of environmental responsibility. Despite having to maintain high air quality for athletes training and competing in different zones in the Centre, the facility produces very low levels of CO₂ and is highly energy efficient. This is achieved by innovative 'passive' engineering and comes despite using existing building services technology.

The site is close to the northern gateway of the Olympic site and is on greenbelt land. In response to the surroundings, it is low facing the green belt and higher facing the main road. Communities' use of the building has exceeded targets and the Centre extended its opening hours from 76 - 88 per week from April 2010 and improved their facilities to accommodate the demand.

CAMPAIGN FOR A SUSTAINABLE BUILT ENVIRONMENT

What lessons were learned and what conclusions can be drawn from this project?

In 2002, Lee Valley Regional Park Authority, with the support of UK Athletics and Sport England, proposed a High Performance Centre for athletics at Picketts Lock. The vision for the centre was to provide a regional training centre as part of a national facilities programme to improve the performance of elite athletes, support to clubs that develop young talent and use by schools to increase awareness and inspire children. The facility was required to be technically excellent and cater for this broad range of users in an inspiring environment that enhanced its surroundings and achieved high environmental standards for a modest budget; all on a brownfield site.

The resulting design by David Morley Architects (completed in 2007) fulfils, if not, exceeds the requirements of the brief, leaving room for further developments:

- The Centre demonstrates how an A-rated DEC can be achieved with an integrated design approach.
- This is achieved by innovative 'passive' engineering and comes despite using existing building services technology.
- Full accessibility for wheelchair users is provided by a network of slopes eliminating the need for lifts in this multi-storey building.
- In winter, radiant gas plaque heaters provide dedicated warmth to the track areas, allowing cooler air temperatures within the large volumes and high efficiency low NOx condensing boilers heat the ancillary spaces.
- Contaminated land was contained safely onsite through capping with topsoil and put to use in providing additional spectator space and acting as a natural wind shield for the track.
- A comprehensive control system monitors all of the spaces. Operational monitoring of the building during use found that in summertime, it met the good air quality needed for athletes but kept the temperature down. In winter it was found to maintain good temperature and a fresh atmosphere.
- Demand for the building use is increasing and as a result David Morley Architects were asked to design an extension for offices and a rest area (completed in 2011).

Whilst the building makes full use of passive means by way of achieving maximum energy efficiency, a number of feasibility studies were completed for additional renewable technologies to be used, including:

- Photovoltaics - designed provisions for photovoltaic panels to be mounted on the aerofoil profiles above the roof;
- Wind energy - infrastructure has been installed for the future provision of a large scale wind turbine adjacent to the building;
- Rainwater harvesting - In an area of high annual rainfall, for greywater use in flushing WC's and irrigating the site, was an attractive proposal. The amount of rain collected over the year would comfortably supply the water demands for toilet flushing and irrigation, which would save thousands of pounds each year in water charges and also make a statement to the community about the centre's commitment to conserving natural resources.

Taking the key points from the original brief, the theme of integration runs through many aspects of this project: linking indoor and outdoor facilities; serving elite athletes as well as club and local community; a dynamic building form that merges with the green belt; using the same components to maximise structural efficiency and low energy issues, and making a functional and accessible plan into an uplifting and dynamic environment to encourage participation in sport.

AWARDS WON FOR THE PROJECT:

Winner of the Sustainability category at the RICS Awards 2010
Commendation in the Best Built Project category, 2009 London Planning Awards

PROJECT COMMENTS/PRESS/QUOTES:

"When I became Chief Executive of UK Athletics in 1997, I recognised that the UK was also lacking the necessary facilities network to remain a world class athletics nation, and thus I instigated an £80m programme of facilities development. The landmark facility in this network was the Lee Valley Athletics Centre, and since it opened in 2005, it has helped the training of Olympic and World Gold Medallists"

David Moorcroft OBE

"In our sport, the three things you need most as an athlete in order to be successful are the right coach, the right environment and the right medical support - you will find all three at Lee Valley"

Charles van Commenee, Head Coach, UKA

"The centre is a hub of professionalism. We have everything here that we could possibly ask for - physiotherapists, nutritionalists, physiologists. I can come here, spend the day and get so much done. It has made life a lot easier and made me work a lot harder. I also recover much more quickly because everything is so close together, I've got every single support service I need coming out of one place"

Jeanette Kwakye, World Indoor 60 m silver medallist and Olympic 100m finalist

'The centre has been extremely well received by the local community and schools; it is seen as a breath of fresh air for the area, and a great facility particularly for school children.'

Mick Bond, LVAC Manager

'The unique design of the building enables the Centre to have that wow factor as soon as you walk in the door with a particularly sensational atmosphere in the evenings created by the lighting and see through structure. Competitions at all levels ... are increasingly being attracted to the Centre.'

Ray Gibbins, General Secretary of the Enfield and Haringey Athletics Club