



**bimacademy**

**Digital Excellence in  
Digital Twin and  
Asset Management**

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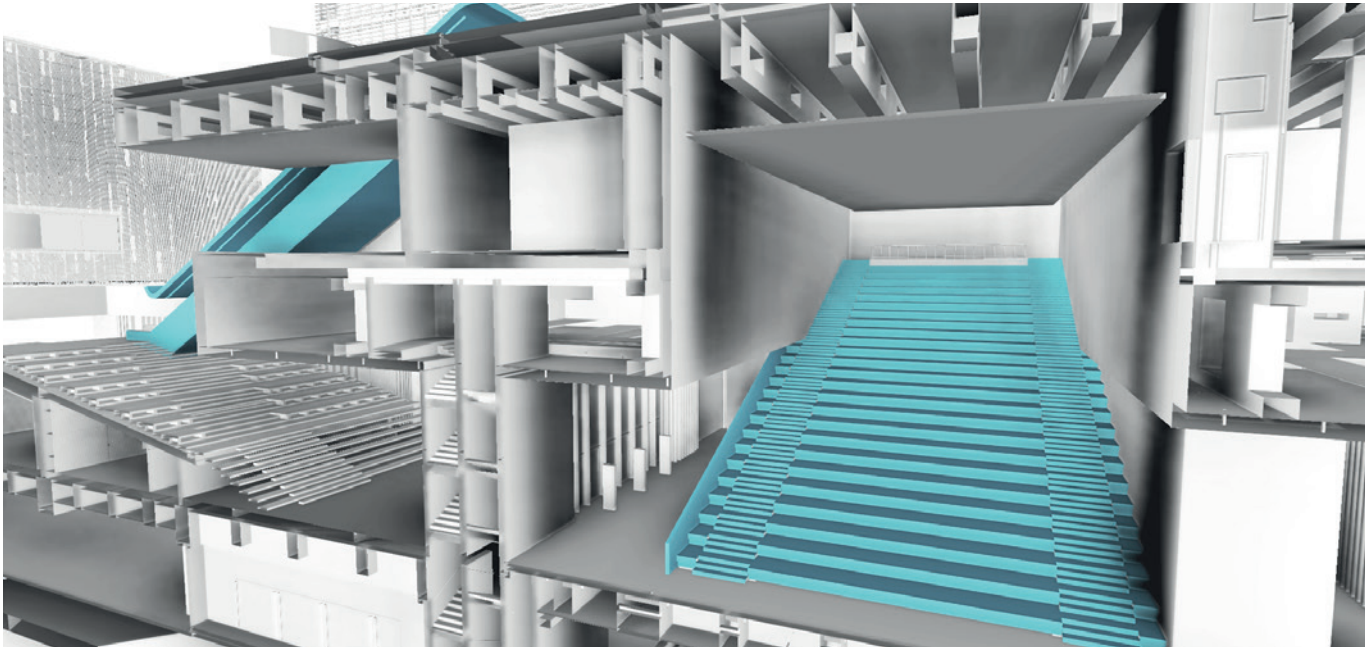
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# Meet BIM Academy

Digital visionaries fundamentally changing the built environment



**We bring a new perspective to the world of digital, enabling our clients to achieve better results. At BIM Academy we are motivated by the desire to improve the way people and technology work together in the built environment.**

At BIM Academy we are a team of visionaries, on a mission to digitally transform the built environment. We act with integrity and we always do what we say we are going to do. We believe in trust and transparency, we're authentic and agile, we work throughout every continent to bring the very best in future thinking to client projects.

We are digital construction specialists, skilled in unlocking your digital potential to drive project success and organisational growth.

BIM Academy was co-founded in 2010 by Ryder Architecture and Northumbria University, with the intention of establishing a centre of excellence for digital construction and transformation.

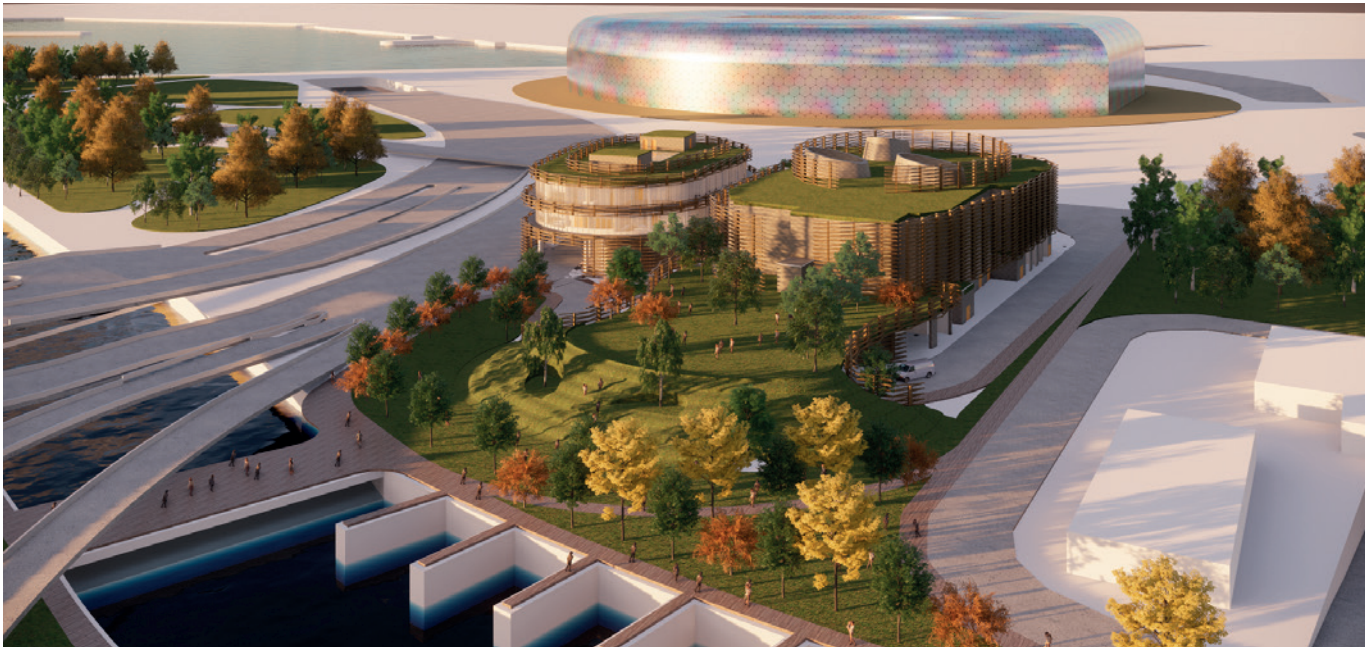
Today we have achieved such status and have taken further steps to transition into one of the world's leading research and strategic consultants in the global digital built environment.

We provide valuable support for construction, real estate and infrastructure through our strategic vision and project management and software development expertise.

At BIM Academy, we help transform businesses through our intelligent application of BIM, smart processes and digital technologies, by guiding our clients along a clear pathway towards achieving their goal, whilst always mindful of adding value and reducing risk.

# Digital Twin Expertise

Trusted by some of the world's most innovative businesses



**At BIM Academy, we are at the forefront of innovation within the built environment and through our collaborative partnerships with industry, academia and government, we are dedicated to the development and use of the digital twin to further enhance the digital delivery of client projects.**

Digital Twin is a digital representation of a physical asset, it can be created in parallel to its physical counterpart and spans all stages of a built asset's lifecycle.

The introduction of the digital twin represents a monumental shift in the understanding of our built assets, posing innumerable application possibilities throughout the built environment. Unlocking ever greater insights into how we design, build, maintain, operate and make provisions of our building and infrastructure assets.

We have over a decade of experience in information management and the digital transformation of the built environment. We draw on our diverse portfolio of past projects that span numerous sectors from education, healthcare, manufacturing, oil and gas, defence and many more. In addition to commercial projects, we also have a strong foundation in academia and since 2019, we have been conducting our own PhD research project in the development of a standardised framework for the Digital Twin.

It is the culmination of our own best practice and industry experience, combined with our academic research that enables BIM Academy to inform our clients from a point of not only current best practise but also from a point of understanding and driving future trends and new developments occurring within the Digital Twin ecosystem.



# Digital Twin Case Studies

Award winning global experience

Aquila, UK

Forest City, Malaysia

Hellas Gold, Greece

Manchester Central Library, UK

MTR Corporation, China

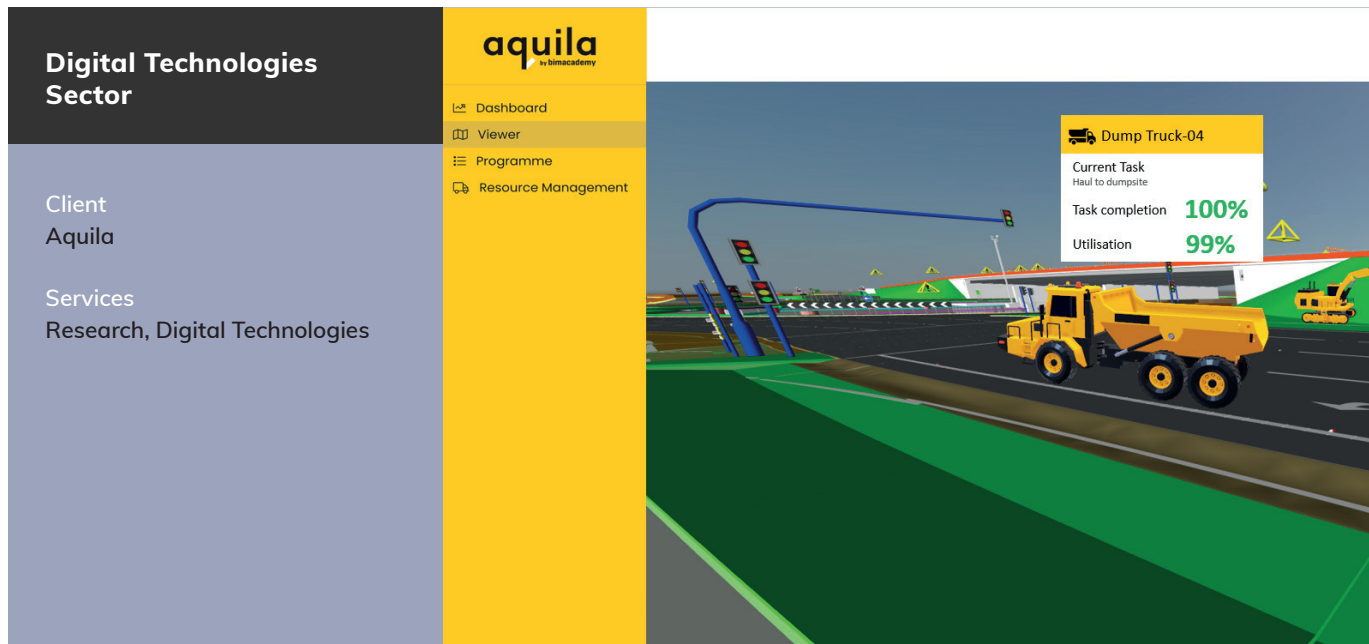
Smart Connected Buildings, UK

Sydney Opera House, Australia

The Royal Household, UK

# Aquila

London, United Kingdom



**Aquila is a new digital tool for monitoring, managing and predicting the performance of plant equipment on site. By combining BIM and 4D scheduling, Aquila will improve construction project productivity and sustainability in real-time.**

Plant equipment, particularly heavy earthmoving equipment such as excavators, bulldozers and dump trucks represent a major cost element in construction projects ranging from 10% in a commercial project, and up to 50% in major infrastructure projects such as highways, railways and energy projects. This is a large part of a project budget that many contractors are getting wrong and seeing significant amounts of wastage.

Aquila links plant equipment to the project work programme using 4D BIM technology, showing real-time activity to accelerate the

understanding of onsite operations. Each vehicle on site will have its own tracking device, linked directly to a digital dashboard, so each vehicle location is known at all times.

This real-time, 4D mapping of plant equipment allows users to review, analyse and report on activity, performance, emissions and location. The built-in machine learning algorithms with Aquila will quickly become initiative to the project, extracting knowledge from the data to optimise the project model for top performance, whilst enabling seamless deployment of the plant equipment for future projects.

The impacts of climate change are being seen across the globe and the accumulation of wasted energy and carbon emissions as well as greenhouse gases are contributing to the heating of the earth's surface. By rapidly cutting emissions we can

lessen the risks of dangerous climate change for the future.

Aquila optimizes plant equipment performance for a smarter, greener future. Designed to fight climate change, Aquila identifies ways to reduce emissions of plant equipment by monitoring output and changing future workflows patterns to be more energy efficient.



# Forest City

Johor Bahru, Malaysia

## Infrastructure Sector

### Client

Country Garden Pacific View

### Services

Strategy, Project Management,  
Digital Technologies,  
Learning and Development,  
Building Performance



**Forest City is a newly-built smart and green city located in Johor Bahru, Malaysia, boasting hotels, golf resorts and luxury homes.**

The Landmark Building is the focal point of the first phase of construction by Country Garden Pacific View for this impressive development. This intelligent and integrated city is estimated to house a population of 700,000 residents.

BIM Academy was commissioned by Country Garden Pacific View to develop a strategy for, and then create, a digital Asset Information Model (AIM) for the Landmark Building, comprising a coordinated multidisciplinary 3D geometry model of the building fabric, structure and services, combined with non-graphical data on the maintainable assets of the fabric and systems.

We worked closely with the project management, modelling and contractor teams to devise a strategy for the development of the geometric models and classification of asset data and means to combine this in a holistic digital information model for improved management of the building and infrastructure.

The project was developed as a 'proof of concept' for delivery with the greater Forest City smart city development, with the intention of replicating the approach across the entire project.

# Hellas Gold

Athens, Greece

## Infrastructure Sector

Client  
Hellas Gold

Services  
Strategy,  
Learning and Development



**Hellas Gold is a gold, silver, lead and zinc mining company headquartered in Athens. It is a subsidiary of Eldorado Gold Corporation.**

Since it began in 2004, Hellas Gold has been developing and operating responsibly, safely and under the strictest environmental conditions. Employing over 1,600, Hellas Gold identified that transitioning to a more digitally-focused way of working would increase productivity and also support its strict environmental policy.

BIM Academy invited Hellas Gold to the UK to show them how to improve information management through the use of BIM methodologies.

Hellas Gold was in the process of planning a future growth strategy and increased operational efficiencies were critical to support this growth.

We began by researching the current business and technical systems adopted by Hellas Gold and understanding current and future business objectives. This research was undertaken in Athens and onsite at the company's Skouries mine in Northern Greece.

When the research was complete, we presented the need for a new digital information management strategy. This strategy was approved and will be first applied to the Skouries mine, which has an opencast area plus 1km below surface level underground mine. This site is expected to produce \$10bn of materials in the next 10 years.

BIM Academy has created a digital model of the Skouries site to support management and information of the mining processes. In turn, the model will also be linked to Asset Management for plant and equipment.

The potential efficiencies lie in the improved reliability, quality, accessibility and completeness of information to support the feasibility, handover and operational stages.

Once fully operational, it is anticipated that the same strategic plan will be rolled-out to all other Hellas Gold mining sites in Greece and to many of the Eldorado Gold Corporation sites worldwide.



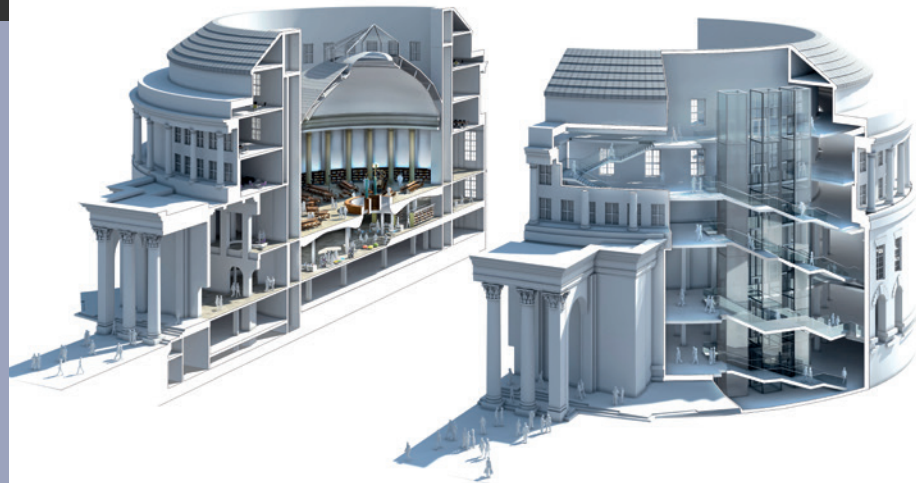
# Manchester Central Library

Manchester, United Kingdom

## Heritage and Conservation Sector

Client  
Manchester City Council

Services  
Strategy, Research,  
Building Performance,  
Learning and Development



**The £170m refurbishment of the Grade 2 listed Manchester Central Library was as a catalyst for BIM adoption by Manchester City Council.**

Built in 1934, the 172,000sqft library was in need of significant structural repair for which the BIM Academy team was enlisted to develop the BIM strategy to lead the project.

From the very outset, the local authority saw significant benefits in ultimately using the digital 3D models from the project and associated data, to manage the library once works were completed, as well as understanding the efficiency benefits during the design, approval and construction stages.

BIM Academy's role included supporting the project team in understanding relevant BIM uses and their practical application, engaging external specialists and

software vendors where required and advising the client during contractor selection.

During the construction stage, we continued to facilitate the implementation of BIM uses for design coordination, logistics planning and asset management.

A key component of the project's success was that the project was managed in a truly collaborative environment with a fully integrated project office. The newly renovated library gained improved efficiencies in safety and asset management as well as restoring the building for further generations to come.

# MTR Corporation

Hong Kong, China

## Infrastructure Sector

Client  
MTR Corporation

Services  
Strategy, Digital Technologies,  
Research



**Mass Transit Rail Corporation (MTR) is regarded as one of the world's leading railway operations, carrying on average 5.9 million passengers per day.**

BIM Academy was asked to support the development of a project which would investigate the feasibility and business case for collating and linking asset data from various 3D digital and 2D conventional formats derived from ongoing rail infrastructure projects, and migrating this data to a new asset and facilities management systems.

The BIM Academy team took 3D geometric models, metadata and handover documentation from the construction and maintenance team, particularly those working on the Kwun Tong Line extension, then reconfigured the data to generate consistency and compatibility prior to successfully testing the migration of data to the new system.

As part of the study, BIM Academy demonstrated practical savings in time and cost in relation to the response times and efficiency of the operational teams.

This return on investment was then used internally within the corporation to support the business case for the further expansion of its BIM programme.



# Smart Connected Buildings

London, United Kingdom

## Residential Sector

Client  
Innovate UK

Services  
Digital Technologies, Research,  
Building Performance



**As part of an Innovate UK research initiative, we were asked to initiate a project with the aim of understanding how a software platform could be designed for use by Social Housing Providers to improve the performance of their buildings and the wellbeing of vulnerable tenants.**

There are currently over 20 billion Internet of Things (IoT) devices installed in buildings globally, and this number is only going to increase. The magnitude of the data being collected is almost unimaginable; ways of exploiting this data for the benefit of the owners, operators, users and the wider supply chain is in its infancy.

Very little by way of software platforms currently exist that can collect and analyse the data on buildings – using occupant feedback, sensors and design models to construct practical actionable advice that building owners, occupiers and

the wider supply chain can use to inform the decisions they make about the design, construction, operation and use of their buildings.

As part of the research project focusing on smart connectivity for buildings, we developed a cloud-based application capable of linking BIM contextual data with operational performance data from smart devices.

The application is a web-hosted dashboard, which acts as a centralised hub where data can be received, collected and analysed. The application links data inputs to building elements such as apartments or rooms to provide context.

The same inputs are used in conjunction with customisable alerts and advice libraries to inform stakeholders of problems and give practical actionable advice to help minimise complaints, promoting a transition to a more proactive

building management approach.

This application has immense value to Social Housing Providers for both new and existing building stock. It can compare 'as design' performance against 'in use' to highlight performance gaps and their cause. Compare performance before and after building improvement work takes place, to quantify success and value for money, and enable proactive maintenance regimes based on the feedback provided by the platform.

This intelligent data platform containing building design information, sensor data and user feedback, produces meaningful actionable advice for building owners and occupiers.

# Sydney Opera House

Sydney, Australia

## Heritage and Conservation Sector

Client  
Sydney Opera House

Services  
Strategy, Digital Technologies,  
Building Performance



**The Sydney Opera House is a multi-venue performing arts centre located at Sydney Harbour in Sydney, New South Wales, Australia. It is one of the country's most iconic and distinctive buildings.**

BIM Academy beat international competition to win a major project to provide specialist facilities management (FM) technical capability for Sydney Opera House.

BIM Academy worked with the client's Building Information Management team, to define and develop a detailed facilities management specification to meet the building stakeholder needs for the existing building and its future development.

We subsequently developed and implemented a unique BIM4FM solution to achieve operational and cost efficiencies to support an enhanced visitor experience, playing

a pivotal role in the conservation and preservation of the Opera House's cultural programme.

As part of our commission, we undertook detailed consultations with stakeholders on current and future needs; conducted a review of its current systems, processes and decision matrix; and created and a detailed technical specification that defines the long-term requirements.

We also developed a detailed model management protocol for the Revit model of the building. This has enabled the Opera House to start the implementation of a web based BIM4FM interface that will link a constantly maintained geo spatially accurate model of the building to its engineering, maintenance and building control systems.

BIM Academy teamed with leading software developer EcoDomus and local AECOM project managers to tender, and subsequently win, the

delivery of the BIM-enabled FM platform.

Rolled out over two years, the project was executed in two stages: the first stage involved successfully retrieving and linking information from existing and new databases via the digital 3D model, while the second introduced a broader range of functional modules that can be added to the BIM interface over time..



# The Royal Household

London, United Kingdom

## Heritage and Conservation Sector

### Client

The Royal Household

### Services

Strategy



**The Royal Household is the collective institution which support members of the British Royal Family. Within this structure, the Property Services Team manage the estates of all 27 occupied Royal Palaces, which include Buckingham Palace, Windsor Castle, St James's Palace and Sandringham House.**

In 2016, Buckingham Palace began an extensive 10 year planned £369m refurbishment – the largest of its kind since before the second World War. This giant restoration project involves the replacing of 100 miles of electrical cabling, 6,500 electrical sockets, 5,000 light fittings, 20 miles of heating pipework and 2,500 radiators.

This work was deemed necessary after restoration experts warned the palace and its priceless artwork was at risk of fire and water damage if repairs were not made.

From the start, the Property Services Team was actively seeking to use this as a catalyst to review and improve how asset information is managed across the entirety of the estate. They appointed BIM Academy to develop and deliver an information management strategy.

We created a corporate and operational strategy for BIM implementation across the organisation, and produced a practical roadmap describing the methods to deliver organisation-wide implementation for better information management.

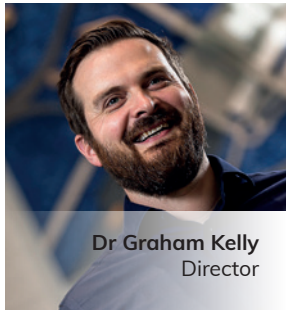
The roadmap detailed the incremental phases of work required to achieve the agreed vision to deliver optimised performance, efficient and effective delivery of projects and operation and integrated digital information systems and processes.

We created all the elements required for the Royal Household to progress in their BIM journey. By delivering a suite of template BIM documents, OIR, AIR and EIRs, we identified potential pilot projects and a recommended training plan for the team.

We are continuing to support The Royal Household as it works through the relevant phases of the roadmap for Buckingham Palace and other estate properties.

# The BIM Academy Team

We operate at the highest level of technical expertise



**Dr Graham Kelly**  
Director



**Peter Barker**  
Director



**Paul Thorpe**  
Director



**Mark Crowe**  
Associate



**Andrew Johnson**  
Associate



**Dr Melanie Robinson**  
Senior Project Manager



**Sangcheol Jeong**  
Project Manager



**Lee Maguire**  
Software Developer



**John Millar**  
Technologist



**Eva Cheung**  
Technologist



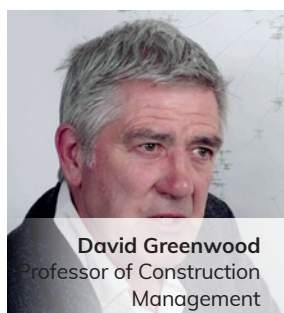
**Murillo Piazzi**  
Technologist



**Lewis Johnson**  
Technologist



**Marcos Gabriel  
Cardenas Pantoja**  
Technologist



**David Greenwood**  
Professor of Construction  
Management



**Dr Kay Rogage**  
Senior Lecturer, Computer  
Information Sciences

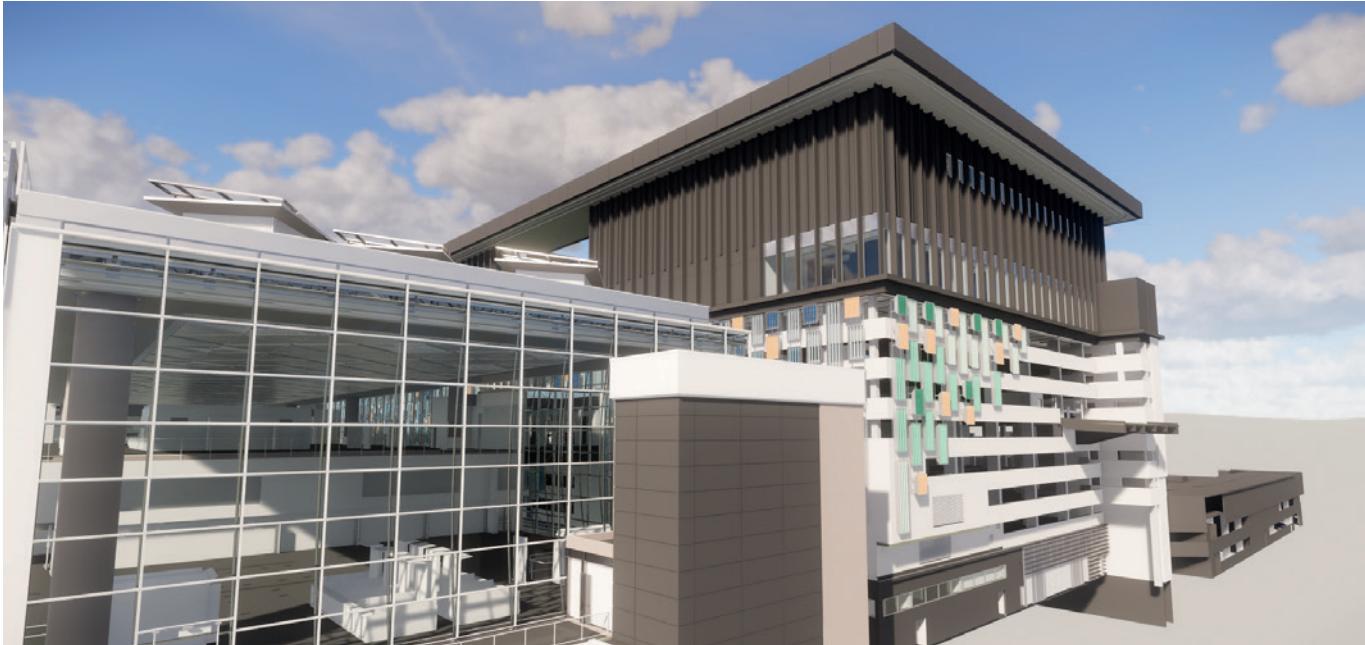


**Dean Douglas**  
Researcher



# Who we work with

Transforming businesses for a sustainable future



**Sir Robert  
McALPINE**



**SCOTTISH  
FUTURES  
TRUST**



**BAE SYSTEMS**



**westKowloon**  
西九文化區



# How to get in touch

Taking our digital expertise global



**The international positioning of our offices allows us to service projects worldwide:**

**Call:** +44 (0)191 269 5444

**Email:** [info@bimacademy.global](mailto:info@bimacademy.global)

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Canada



# bimacademy

Our mission is to help our clients transform their working practices to achieve genuine value, reduce risk and introduce intelligent applications to achieve a digitally enabled future.

