BAM built a new six-storey building for Bradford College, to provide an innovative and technology rich learning environment for their 20,000 strong student community. The new 23,000m² building was constructed on the College’s existing city centre site.

The building is the second phase of the College’s Accommodation Strategy, which aims to deliver efficiencies and improve the student experience. It is reducing the number of sites and overall quantity of space it occupies by 33,000m². BAM also delivered the first phase of the strategy in 2008, when we built the College’s Trinity Green Sports Campus, and we’re now constructing their new Advanced Technology Centre next door to the David Hockney building.

The David Hockney Building was constructed in phases on a tight city centre site; adjacent the main College building – the Westbrook Building – and surrounded by a main road, pedestrian areas, local businesses and residential neighbours.

Phase One: Demolition of the Westbrook Building’s entrance and the construction of a new temporary entrance within an eight week period. This provided the college with safe access and allowed us to establish our site.

Phase Two: Construction of the new building, which consisted of foundations, six-storey post tensioned concrete frame, façade with a mixture of stone, brick and rain screen cladding, areas of curtain walling and M&E and finished installations to teaching areas.

Client: Bradford College
Contractor: BAM Construction
Architect: Bond Bryan Architects
Quantity Surveyor and Project Manager: Turner & Townsend
Services Engineer: BAM Services Engineering

Floor area: 23,000m²
Dates: July 2012 - March 2015
Value: £35.4m

Key Features:

- Handed over two weeks early, despite four weeks of snow
- Useful and accurate data available at the workface
- 70% improvement in site efficiency
- £1,000 of savings due to process improvements
- 85% fewer snags and no quality issues on handover
- 20% reduction in steel and concrete used in the frame
**Issues resolved through the use of BIM at Bradford College**

**Design co-ordination, programme and logistics**

We use Navisworks and Asta Power Project as our planning and co-ordination tools. At Bradford College we also worked with Bond Bryan Architects to make sure the design model facilitated the construction process and instilled confidence that the timeline worked.

We co-ordinated the model with the build process to allow us to use it for scenario planning and also exported space information to help create a planning and logistics model that included the works information from the temporary works contractor. M&E services and plant were integrated into the model for co-ordination and to give us confidence that everything would work as designed. It also smoothed out the installation, testing and commissioning process. We even modelled the site set up and hoardings lines so that we knew our solutions to tackle the tightly constrained site and multiple demolition and construction phases, would deliver.

**Improved quality, greater efficiency, better collaboration through BIM 360 Field**

The implementation of BIM 360 Field had the biggest impact on this project. It combines the latest technology and BIM data to improve site management, providing a more efficient and collaborative method of leveraging project information during project delivery and handover.

We provided site supervisors with iPads and Autodesk BIM 360 Field technology, to allow them to access design information at the workface, monitor progress at the point of construction, and feedback any issues into the model. This allowed us to implement lean delivery techniques, target waste reduction and save time and money. It also provided us with the confidence to work in non-traditional installation sequences for M&E and ensure quality is monitored at point of installation.

BIM 360 Field gave us a more transparent way to deliver the project. It also gave Bradford College an enhanced digital asset, that they can use to manage their new building more efficiently and more sustainably, saving them time and money.
Issues resolved through the use of BIM at Bradford College

Improved team collaboration
Our use of BIM 360 Field made site teams active participants in the design process. Data was fed back to the BIM model from site, and the design team were challenged to solve design issues more promptly. This helped us to keep on programme, on budget and lowered risk. All information was available to all members of the project team all of the time, via a cloud based portal and email notifications. Information inputted at the workface was synced back to our federated design models providing up-to-date commissioning and progress data.

BIM 360 Field was embraced by all our subcontractors, with feedback saying they’d like to use it more as it had a real positive impact.
**Benefits of BIM**
Accurate and instant design information at the workface
BIM 360 Field on iPads allowed the site team to capture point of construction information for any issues related to safety, commissioning, work and snag lists, and to access the latest drawings, specifications, standard and project specific quality checklists, as well as the BIM. As the information was kept up to date in the model, the risk of working to outdated design information was eliminated. Paper copies were not needed reducing the project’s overall environmental impact.

**Efficient site management**
BAM’s use of BIM 360 Field improved site efficiency by 70% at Bradford College. A good example of this is scaffold inspections. The previous seven-step process would take a manager around 2.5 hours to complete and involved several device interfaces. This cost circa £60, including administration costs. Using BIM 360 Field, the process now takes just 20-30 minutes to complete a four step process, using one device at the inspection location. This has saved around £45 on costs. BIM 360 Field has also meant our site managers have spent much more time out on site, leading to improvements in quality and health and safety.

**Improved quality and a reduction in snagging**
BIM was used to develop a virtual mock-up of the building. As we built the mock-up, we checked the quality at every stage and developed a bespoke project check-list for our supervisors to sign off at each stage. The team were able to access these check-lists using iPads and view any part of the model, all drawings and specifications, to help effective quality management. As a result, the tick-sheets no longer had to be carried out on paper in the site hut, freeing up supervisors to spend more time overseeing works.

Dynamic dashboard reports showed the live status of site performance, work carried out, number of issues and time taken to resolve them. Snagging as we go led to an 85% reduction in snags at handover. The system was also used for monitoring and recording the testing and commissioning.

**BIM after handover**
One of the advantages of using BIM is having the ability to extract the COBie data required to operate the building. This data can be imported into the life cycle management systems of the college to provide useful information that will help them manage their running costs. In addition, as the BIM was kept fully up to date throughout construction, the college now has a model which is a true reflection of the as-built works and can be used throughout the operations and maintenance phases instead of paper plans.