

Case Study

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Murphy Ireland deploys Evercam's innovative construction camera technology to enable remote project management at their Ringsend Phosphorous Fixation and Recovery Project.

Project Background

Murphy Ireland is constructing the Ringsend Phosphorous Fixation and Recovery Project using Ostara's Pearl® phosphorus recovery technology. Upon completion of the project, the Ringsend Wastewater Treatment Plant will reduce the phosphorus released in the treated effluent and the phosphorus recovered will be processed to produce sustainable fertiliser for use in agriculture. This project is the first of its kind in Ireland and, once installed, will be the largest in Europe by reactor volume. It involves the use of innovative technology to sustainably remove phosphorus from the wastewater being treated at Ringsend WTP.

The stipulated time of the project is 90 weeks with the use of approximately 169t of steel, 780m of pipework, 241 valves and 9 pumps. Since this is a huge project and the first of its kind, Murphy's use of visual documentation with Evercam is seen as critical. The value of construction cameras needed on the job site cannot be over-sighted.



Image by Murphy Group



Challenge

Murphy Ireland is an integral part of Murphy Group, a leading global, specialist engineering and construction company that operates throughout the United Kingdom, Ireland and Canada. Like many other construction companies, they have multiple projects spread across their borders of operation. This may pose a challenge to project managers, operations managers, and company leadership to keep an eye on multiple projects. Management would require travelling every so often to job sites, which would cost a great deal of time and money. On the other hand, identifying and correcting mistakes must be done as soon as possible, especially for a project like this; where utilities require absolute keenness during construction and having limited time at the job site can make that difficult. For this particular project, site constraints such as vehicular traffic, minimal storage areas and tight site boundaries along with all other risks that come hand in hand with working in a live treatment plant were identified at an early stage of the project.



Solution

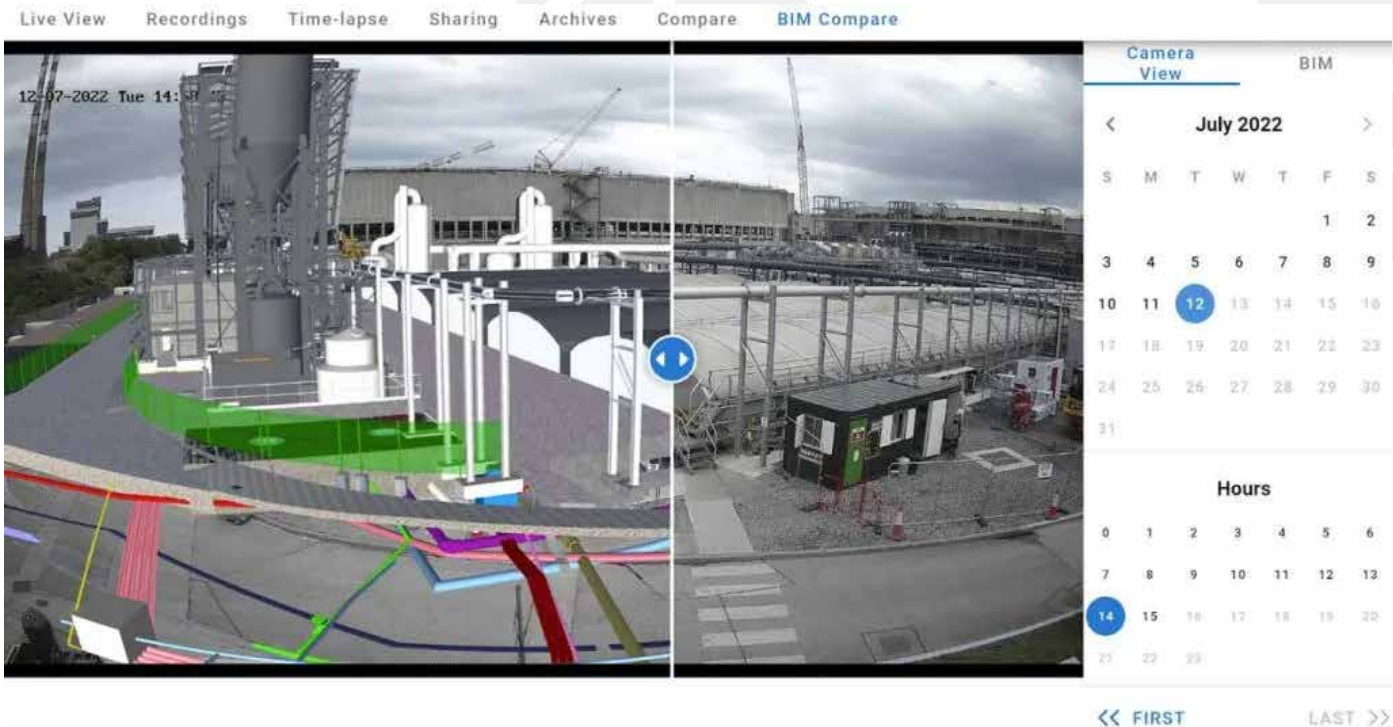
Murphy Ireland required site cameras that would allow them to remotely monitor and document their projects. They went with Evercam Construction Cameras after considering the many project management features that come with its installation, including live view, full video recording and integrated project management tools. The company made the conscious decision to focus on digital construction methodologies to produce a highly accurate product whilst maintaining a testing programme with minimal interfaces with the existing plant operations

The Benefits

- Live view & remote monitoring – The project team are able to monitor the progress and productivity even remotely. Evercam’s easy-to-use interface allows users to switch between each of their projects within the dashboard.

- BIM Model – This feature allows users to overlay a BIM model with real-time, high-resolution images of what’s actually happening on the construction sites.

In this study, we get some great insights from Patrick Maguire (Senior Project Manager), Declan McFadden (Construction Manager) and Michael Kenna (CAD & BIM Engineering Team Manager) on the importance of using BIM for this project.



Main Feature Used: BIM – Building Information Model Integration

Michael: “Building Information Modelling was a specific client requirement for use on this project and was specified in the Employers Information Requirements (EIR) document. Autodesk Revit is the primary design software used and drawings were produced for extraction of quantities, enhancing the use of off-site fabrication, multi-discipline coordination of models(both consultant and suppliers) and data input and output. The data output was also a client requirement, and this output was in form COBie (Construction Operations Building Information Exchange) data sheets. Autodesk Navisworks was used as a design review & project management tool. Project models were federated into an overall site model to produce a “whole project” model. Model reviews were then carried out with project stakeholders to produce a clash free model. 4D-construction simulation was also utilised on this project. Model elements were linked to construction programme tasks to produce a construction sequence animation. “



How was Building Information Modelling & Evercam Integration used?

Declan: “The BIM model was used for generating a graphic that would be used during the constructability review, which showed all the different elements of the build and the methodology for constructing them. The BIM Compare feature within the Evercam software was then used to demonstrate to the client that the methodology was executed as described initially.”

What were the steps taken toward planning and implementing BIM on the project?

Michael: “The in-house design team received formal training in the use of BIM software with some of the team returning to third-level education to enhance their skills. An internal learning schedule was also set up to review & enhance this training. Internal “lunch & learn” sessions were carried out with project teams (both site and office based) in the use of BIM tools such as Navisworks. Testing also took place with the in-house fabrication design team; models were exchanged, imported and exported to find the best solution in enhancing the off-site fabrication process”

Who were the key members of this project?

Patrick: As this project was a design and build, key team members were appointed to cover all levels of disciplines (Civil, Mechanical and Structural). There was an Information Manager appointed to collate and manage all building information and a Construction Manager to process this information into the Works. A MEICA (Mechanical, Electrical, Instrumentation, Control and Automation) Contracts Manager was appointed to co-ordinate all information with suppliers and to ensure imports into the model were reflective of the equipment being delivered. This also aided in identifying clashes in the system and altering both pipework and equipment to fit holistically within the structure.

Were there any barriers to the implementation of BIM?

Patrick: While BIM integration and implementation were embraced with enthusiasm, the main challenge was making it default across all elements of the works. Despite being adopted early on in the project, there were challenges in the lack of familiarity and infancy of a project of this scale being delivered. This was across the entire project team, including subcontractors and suppliers.

How were the barriers addressed?

Patrick: Regular team meetings were conducted and extensive demonstrations and workshops were hosted by Murphy’s in-house BIM team for the projects team. By outlining the benefits of BIM to all project members, its usage was not only seen as an advantage for a few members but an overall project benefit. Strict standards and procedures were agreed upon with all suppliers in advance of commissioning works to also ensure that there was a consistent approach to the works from the onset, and that data was being exchanged and managed in a way familiar to all.

Benefits of BIM Integration and Evercam's construction cameras to the project?

Michael:

Construction sequencing
Off-site fabrication
Assembly logistics
Access planning
Communication with plant owner
What were the results/ milestones after camera installation?

Declan: The biggest milestone of the project, which incorporated most planning and use of BIM during construction, had to be the construction and lifting of the Pearl reactor, the centrepiece of the project. Upon becoming aware of this milestone Evercam produced a special ten-hour in two minutes time-lapse piece capturing its placement in the awaiting steel frame building. This production was shared with stakeholders fundamentally celebrating this achievement with the full project team.

Michael: The 4D construction simulation proved to be successful and well received by the client. Linking model elements to the project programme, allowed Murphy to provide a digital rehearsal of the overall construction sequence, but specifically the difficult installation of the prefabricated Pearl Reactor Tank.

Patrick: Using the 3D model, the team was able to size elements of the work (pipework) alongside other design elements. This allowed a federated model of the works to ensure that, where possible, elements of the works could be fabricated off-site where possible. Additionally, parts of the works which could be pre-assembled off-site, were identified with the use of the 3D model. This was challenging, considering the tight constraints on the site. However, by pre-assembling, we were able to ensure elements fit within the constraints of the existing plant, meaning less time spent in potentially hazardous environments or the possibility of causing disruption to existing plants.

While there may still be physical site visits, the overall frequency of team members visiting the project has been reduced. The project team members have 24/7 access to view job site conditions, no matter where they are. Cameras are also shared with owners so they can see their projects coming together. The cameras have also helped Murphy Group to identify problems before they could become costly errors.

Any future steps?

Patrick: In the future machine learning and AI will enable improvements in terms of health and safety at the design stage by identifying risks in the layout, based on collated data on methods to implement a given design. For example, being able to identify works from heights or sequencing issues with the construction. It is envisioned that this may also be used during construction with real-time images. This would have huge benefits and it would be the first step in automating the selection of methods for construction, which will bring more control into the environment in which we implement work.

Michael: To ensure that the use of 4D construction sequencing becomes more of an everyday way of working, which would allow better programming of the sequence of construction activities. Evercam's 4D View BIM Integration can directly enable this as it brings the 4D model, including the timeline directly into a live camera view.



A live Evercam camera integrated with a BIM model can be shared with multiple project stakeholders. This integration gives more stakeholders access to BIM data than ever before, all within the Evercam platform and allows users to receive an instant update of the project as planned (BIM data) versus the project as-built (live camera view). Murphy Group is currently dealing with numerous overseas project stakeholders and also has some upcoming projects outside of Ireland, meaning this technology is critical for frequent and meaningful stakeholder engagement.

| Testimonial

“Evercam was recommended to me by a Murphy colleague who was using the software on another project. Although admittedly, I was slightly dubious at first of the benefits that the package would bring, I can truthfully say now that it has been a fundamental tool in the planning and implementation of all construction-based activities. With features such as gate reports, screen editing, weather reports and recording and BIM compare all available to authorised team members, it creates transparency and responsibility for the full project team.”

Declan McFadden (Construction Manager)

