Sitedesk

Holding back tides of cost and risk – as well as seawater

Client: Wyre Council
Industry: Local authority
Project type: Coastal defence

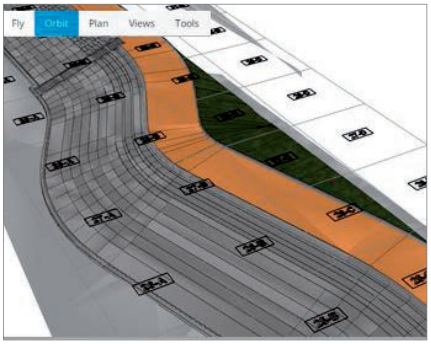
Wyre Council, Blackpool Council, Fylde Council and the Environment Agency are collaborating on a major 6 KM coastal defence scheme in North West England. It will protect several communities, more than 12,000 properties, and historic and natural environments that include several sites of special scientific interest. The coastal defence scheme is designed to protect coastal communities from some of the roughest seas, strongest currents and highest waves in the UK which have, in the past, overwhelmed homes, walkways and highways.

Until the defences are completed more than 7500 properties in Rossall, which is situated between Cleveleys and Fleetwood in the Wyre Council area, are at risk of flooding. In nearby Anchorsholme a further 4500 properties are similarly at risk, with additional fears of sewerage flooding affecting both areas, thanks to a pumping station situated as part of the sea wall at Anchorsholme. This adds up to a Council combined liability of over £100 million and a significant risk to lives should aging defences fail – prompting the trio of councils to take significant action.

This multi-party, major construction project was initiated in 2012 — before the BIM specification PAS1192-2 came into effect and before PAS1192-3 was even published. There was a realisation that conforming to these proposed standards for BIM part-way through the project might cause some issues, but it had been identified at the outset that 3D modelling and information management would play a critical role in delivering the desired outcomes for the client and the community throughout the lifetime of the asset.

Carl Green, Head of Engineering Services at Wyre Council, leads the programme. With over 20 years' experience in design, construction, operation and maintenance of major civil and coastal engineering projects, he recognised a number of key challenges early on. He chose Sitedesk to help explore and resolve many of them.

Completed section of lower rock revetment [Image: Wyre Council]



BIM model showing a grid overlay of the coastal scheme. Folders map to the grid, which makes it far easier and faster for users to locate the information that they need.

Each rock on the beach has its 'as-built' location automatically logged using machine control. GPS outputs are added to the site diary along with the correct grid location.

Staff on beach construction site reviewing information on tablet computer. Here they are enhancing as-built data with HD video recordings from a quadcopter.

Site diary entry page created in Sitedesk's form creator. Users can structure forms as they wish, and link content from any source to any part, system or space in the BIM model.

"We chose Sitedesk because it makes it simple to take advantage of the whole life cost benefits of BIM, without the exposure to high hardware, software or integration costs."

Lost and missing information

As project planning commenced it became apparent that some critical documents were missing, destroyed, damaged, thrown away or simply lost – this meant some expensive searches had to be undertaken. A significant amount of time, money and resource was expended simply relocating certain critical infrastructure which passes through the coastal defences. Carl explained: *"The main issue is that the information in our archives isn't complete. Some information had been lost, some had been borrowed over the years and not returned, and some wasn't captured in the first place."*

Capturing reality

As with any construction project, identifying any areas of future risk or capturing specific details to help minimise OPEX and commercial risk was a vital part of augmenting the 'As Built' information provided by the contractor. Future council officers and service providers would need to oversee, maintain and repair the resulting scheme, and that meant they would require easy access to information — not just about design but about resulting infrastructure. *"I was determined that the next generation of people who would be renewing the defences in 50 years' time wouldn't face the same challenges as my team"* says Carl.

Information volumes

A project of such massive scale generates a huge volume of information. Left unmanaged it could quickly give rise to a similar future inability to find critical information when it was required. At the same time, there was recognition that capturing the right information, not just all information, would be a critical success factor. This was particularly true with its complex workflows, where information would need to be captured in the right combinations and aligned with specific processes or compliance standards, to be of value. Carl commented that "The natural view of many in the team was to attempt to capture all the data possible. It quickly became clear that, on a project of this size, this approach would be unsuccessful due to the sheer volumes of data that could be generated."

Site fluidity and expansion

The scale and location of the project's construction sites meant that construction operatives were spread over a wide area with multiple work-streams being delivered concurrently in different locations. The project work area primarily consisted of beaches where 3G and 4G telecom signals were undependable and wi-fi non-existent. This created the need for site managers and project teams in the field to be equipped with tablet computers to capture and deliver the required information.

Sitedesk: a solution for the long term

The Sitedesk consultancy team took on board all of the outlined challenges – but added a significant additional dimension. Via a workshop, it explored with Carl and his team the real long-term aims and objectives. These were not simply to construct the defences but to minimise costs and risks over the entire lifetime of the assets, as well as to comply with BIM standards. The team was very keen to gain one of the major benefits of BIM: a much clearer view of total expenditure. All councils will recognise that, left unchecked, the maintenance cost of assets only rises, eating away at precious budgets which are constantly under pressure from new needs and demands.

The team defined its own data needs. Carl explains *"We looked at our requirements during the pre-design, design, construction and operational phases and decided on the data we would need to capture at each stage to meet these, and optimise asset management and minimise maintenance costs throughout the lifecycle of the project. We formalised this into a document to use as a template to ensure and verify that we captured the required information. What was most interesting was how different the new EIR was from our initial Employers Information Requirements document."*

Armed with a far clearer picture of the challenges it was setting out to resolve, the Sitedesk team supported the client to create simple, easy-to-use templates in the software's workflow creator. These would help all team members capture the right information, including pictures, video and audio, that could be attached to specific elements or areas of the scheme. This will enable future maintenance teams to zero in and locate the relevant location and element in a single click. It will allow them to work faster as well as provide the supporting documentation they will need at their fingertips.

Carl said: *"We are creating bespoke digital forms for each of these workflows, so we can automatically assign the work to a council officer or subcontractor with the correct information and drawings"*

With such a sizeable scheme it was critical that all information provided by the contractor could be validated while the project progressed. The form-based approach provided an immediate validation mechanism to enable team leaders to verify progress during the build; this would enable tighter expenditure control and risk management, and deliver decision-making information in real time. It would ensure greater data accuracy and quality and avoid a costly, less accurate and less reliable post-project validation process.

Another early activity was to overlay a 3D grid over existing plans and start to break down the project into pieces that were manageable from a data capture and workflow management standpoint. *"The grid scheme has helped minimise errors by breaking a large scheme into understandable pieces which has helped make the evolution into BIM workflows far less challenging"* said Carl.

Sitedesk software benefits to the programme include:

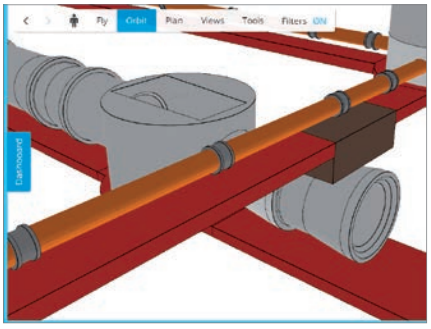
- Project visibility and control for a wide variety of stakeholders
- Protect against future document loss with digital data capture
- Manage and deliver complex workflows with custom forms and templates via in-built form creator
- Automated risk control with contemporaneous notes
- Time and user-based task assignment
- Validate progress and expenditure in real time
- Provide appropriate user access to information — anytime, anywhere, via standard kit
- Deliver the CAFM database and solution at the same time as the build
- Unlimited data type capture, even in the field — image, video, audio, spreadsheets, PDFs, MS Office, scanned paper, laser scans, 2D plans, 3D models
- Ease-of-use for all internal and external stakeholders and supply chains
- Expert support to focus and set programme and project data objectives and requirements
- User training to help accommodate important data capture and management behaviours

"This exercise made us think about and define our workflows, particularly in relation to planned maintenance schedules and how we cope with unexpected reactive maintenance."

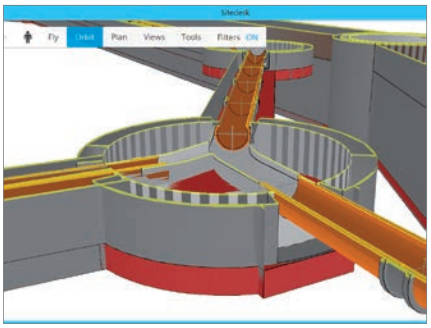
The Sitedesk team helped to guide Carl and his team to specify and capture the right information which, if captured through automated and template processes during the project, would allow Sitedesk to act as a complete solution for construction information management as well as an asset information/CAFM system. The software also gave the client the ability to generate a COBie output in line with BS1192-4: 2014 to support data transfer to another CAFM system, should it wish to do so in the future. Sitedesk thus eliminated the costs of purchasing a CAFM system, as well as the time and cost of future data transfer.

Team members were equipped withSitedesk software, a SaaS solution that runs on standard specification PCs and council-issue tablets. Because Sitedesk delivers an in-built 3D viewer, and also eliminates the need for many 2D viewers, document viewers and mark-up tools, every team member was immediately empowered with the same access to information that they would expect back at HQ – but on the beach. Although the Sitedesk tool itself is intuitive to use and fast to learn, Sitedesk's team also provided tailored training to help users recognise the importance of information capture and ensure that the transition into digital data capture quickly became a natural and time-saving part of each person's role. As Carl explained *"We managed to find Sitedesk, which can handle large complicated models on mobile devices as well as desktops, of all the file formats and versions that we require. Sitedesk also allows all members of the team to use existing documentation and workflows, if required."*

"Sitedesk provides us with the ability to integrate all of the benefits of the 3D design and virtual construction process into our asset management and FM processes, without the cost of an FM system or the data integration costs."



Drainage system inspection chamber. Information about systems that have been covered up remains accessible – along with accurate location data making future maintenance simpler and more cost-effective



Section view of drainage inspection chamber. Cut throughs of any area of any model on any plane are done with the touch of a button, making it quick and easy to see how everything is connected.

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