

8.2

Demonstrate how your organisation has used BIM on projects to add value and deliver benefits for clients, please provide an example.

Preferably case study document.

Since 2010 the Carey Group has been using 3D modelling on all our major projects for both demolition and construction. We have recently been audited by BSI and have achieved BIM Level 2 certification as a Tier 1 contractor.

The Carey Group possesses significant BIM capability through our in-house design team (CDT), which comprises six BIM technicians and one BIM lead, all trained through BRE and ICE, under the director of our Digital Engineering/BIM Manager, Vas Tcaci.

To support our capability to deliver any BIM project, we have invested significantly in our IT systems, BIM related research and development (approximately £500,000 annually) as well as in our people, and a suite of BIM software, including:

- Navisworks Manage 2019
- Tekla BIMsight 2019
- Revit 2019
- Solibri model checker 2019
- Synchro 4D 2019

With this range of software and knowledge available within the Carey Group, we are ready to apply the correct tools to suit the particular needs of a project, ranging from structural design modelling, ground modelling to cut-and-fill exercises, temporary works clash detection, 4D planning, point cloud scanning, fly-throughs, and methodology animations.

Our team is experienced in providing detailed visual method statements for any specific tasks in any project. Whether it is a routine task that is done site-wide, or a more complex and intricate task, our clients have seen enormous benefit from using our visual method statements to improve understanding of methodologies. Our visual method statements also provide an easy to understand demonstration of site tasks, eliminating language barriers and improving coordination and understanding by site teams.

The common data environment is established at the beginning of the project depending on the EIRs. As a business, we have extensive knowledge using the popular CDE packages including Conject, Aconex and Asite.

To demonstrate the value of using BIM Level 2 we have attached a case study for CONFIDENTIAL PROJECT. Multiple Carey Group companies are currently working on this BIM Level 2 project.



“ _ will re-imagine the mid-20th century listed building through elegant interior upgrades while still maintaining the integrity of the property through the preservation of the building’s original, Grade II listed facade - **Rosewood Hotel, Press Release** ”

Confidential project, previously the prestigious American Embassy in London, is being transformed into an ultra-luxurious hotel. The hotel will boast 137 rooms and suites for guests, alongside dining and entertainment spaces, a spa, six retail spaces and a grand ballroom with space for 1,000 guests.

Careys was appointed by Qatari Diar to complete a range of works on this site, including the internal soft strip, external works, secant piling and excavation to create a new enlarged basement perimeter, retaining the historic facade and diagrid floor, complete refurbishment and demolition asbestos survey and the subsequent removal of all asbestos identified, structural alterations, and protecting historic assets - such as the famous gold eagle that guards the entrance.

Collaborating for the success of a project

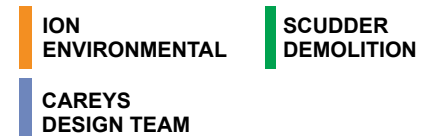
As principal contractor we hold responsibility for the discharge of planning pre-commencement conditions and satisfying the pre-commencement requirements of the Section 106 agreement. We work closely with Westminster City Council (WCC) to ensure compliance with the relevant conditions and produce highway designs to the satisfaction of the highways team.

This project is a significant example of the capabilities of the Carey Group, as multiple Group companies are working together toward the successful completion of the project, including Careys Civil Engineering (CCE), Scudder Demolition, ION Environmental, and Careys Design Team (CDT). For example, asbestos was used as a cast-in socket to secure the screws to all window mullions, and so ION has been instrumental in the detection and removal of this ‘unexpected’ asbestos.

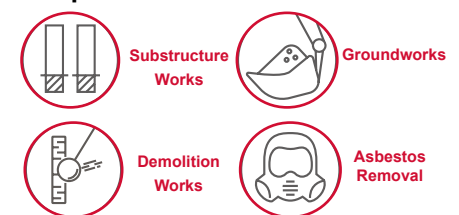
Initial site investigation and BIM modelling

Initial works on the project began with one of our engineers scanning the existing structure and creating a Revit 3D model based on this information.

Also involved:



Scope of works:



Key facts:

- This is a BIM Level 2 project.
- CDT have been heavily involved.
- The building will retain the iconic stone façades which was designed by Finnish-American architect Eero Saarinen in the 1950s and was granted a Grade-II listing by English Heritage in 2009.
- This is only a small part of the wider £1 billion redevelopment of the Grosvenor Square area.

Client

Qatari Diar

Location

Mayfair, London

Principal Contractor

Careys Civil Engineering

Value

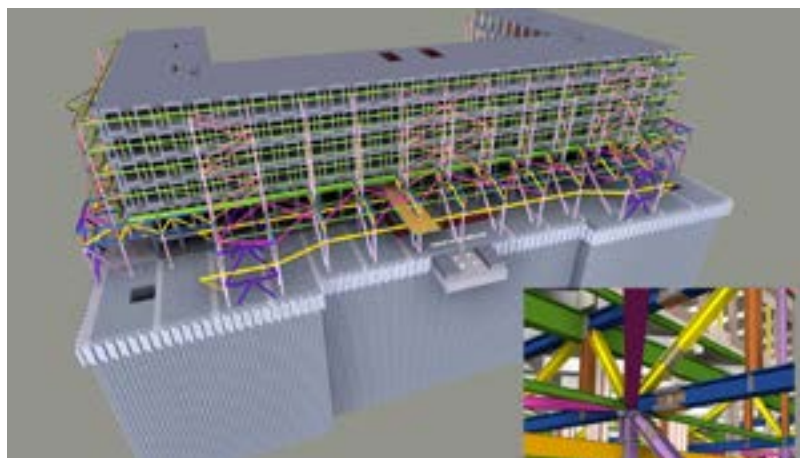
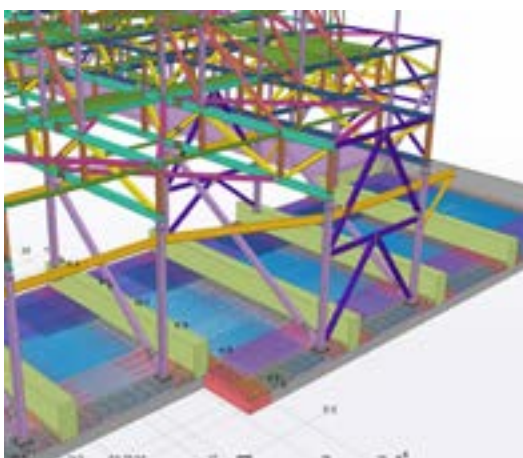
£- million

The scan enabled us to capture the existing condition of the building (and surrounding buildings) and compare them with the historical information to identify any discrepancies and inform the client. Capturing the information accurately was critical for the temporary works design and construction sequence. We also produced a BIM Executive Plan for this project, and we currently manage the entire BIM process on site.

Developing complex designs - facade retention

Once the scans and the existing structure model was complete, we detailed the temporary works model in Tekla Structures to LOD 400 and the permanent RC formation structure in Revit to LOD 400 including rebar detailing. These models were shared with the project design team in the common data environment (Aconex) and clash detection was carried out by Careys - see below for images of the BIM model.

The facade retention scheme consists of multiple towers and horizontal water trusses spanning between them. CDT designed the facade retention to comply with strict AKT criteria and identified that a relaxation of the allowable deflection limit could be considered during subsequent phases of design, potentially saving costs on future steelwork. The retention towers were designed on plunge columns which had the potential to create significant deflections in the façade due to settlement. To mitigate this, we incorporated the flexibility to adjust the tower leg levels and keep the façade structure within acceptable tolerances rather than relying on the stiffness of the façade structure itself.



Preconstruction and planning

Careys used the BIM models to create a detailed 3D sequence of the demolition and construction works to enable us to identify the safest and most efficient method of demolition and construction. The model was also linked with the programme using Synchro 4D software.

See overleaf for examples from our Construction Phase Plan, and the 4D Planning - Synchro 4D Model.

TOP-DOWN OPTION - CONSTRUCTION SEQUENCE
PHASE II



EAST VIEW



WEST VIEW



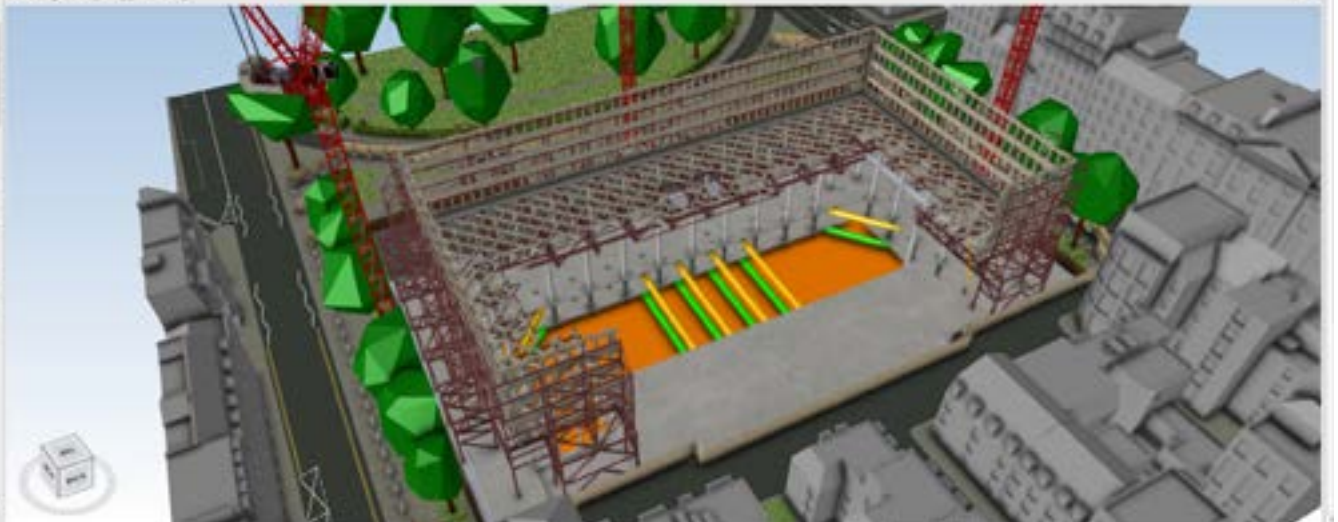
NORTH-SOUTH SECTION



WEST-EAST SECTION



3D Using Clashes (West) (2016-08-10)



Construction

Throughout the demolition and construction we have made use of the BIM model to create visual method statements to communicate this with our workforce, and to keep the client well-informed about the works. The Synchro model was also used in meetings and to create progress reports.

Ensuring a successful project handover

At project completion we will handover to the client the final asset information model showing the completed works package to enable the client to hand over to the next contractors that will be working on the site.

Bringing multiple benefits to our client through BIM

- A record of the original building.
- A record of the condition of the facade, and the other parts of the building which had to be retailed before the works could begin.
- A record of the condition of all adjacent buildings so that the condition can be monitored and avoid any unwanted disputes.
- Certainty in the cost and method of the demolition and construction phases of the project.
- No hidden charges as we were able to provide an accurate price from the outset.
- Clear communication between the contractor (Careys/Scudder) and the client.
- No delays to the project.
- Clear communication and documentation for the follow-on contractors.



A slide from our visual method statement.