

INNOVATION, SUSTAINABILITY + DIGITAL IN PRACTICE

ISDIP

ISDIP109 4D Visualisation and VDC Capability	
Date	23/09/2025
Business Unit	Engineering Services
Project & Region	Multiple Projects – All regions
ISC Themes	<ul style="list-style-type: none"> • Management and Governance • Innovation

1 What Happened?

Fletcher Construction has been on a journey to develop and apply 4D visualisation across its business units (Brian Perry Civil, Higgins, and Fletcher Major Projects) over the past few years, to support project teams in bids and project planning to better communicate construction methodology. Key examples include:

- **Seaview Wharf Renewal (Wellington)** – The BPC team created a 4D model to show their client (CentrePort) how a jack-up barge would be used to deliver the wharf upgrade. This visual walk-through helped illustrate the marine construction sequence and resource requirements. [Seaview Digital Oct 22 \(1\).mp4](#)
- **Kaitoke Flume Pipeline (Wellington)** – Brian Perry Southern used a 4D visualisation to explain to Wellington Water the methodology for replacing a remote water flume, demonstrating step-by-step how the work would be executed. [Kaitoke model final.mp4](#)
- **Reeves Road Flyover (Auckland)** – Fletcher Major Projects—assisted by Engineering Services—developed a 4D construction sequence for the proposed Ra Hihi - Reeves Rd Flyover. This model allowed the team to clearly see the staged bridge construction methodology, improving their understanding of how the project would be built. [EBA flyover staging.mp4](#)

Building on these early successes, Engineering Services established itself as a centre of excellence for 4D visualisation. For a recent Fiji Roads Authority (FRA) bridges proposal for Higgins, the Engineering Services team produced three short 4D videos. One was a 90-second fully animated bridge construction sequence created in *Fuzor* (a 4D modelling tool), with explanatory captions added in post-production. The other two videos were generated using a simplified SketchUp model: the team exported a series of still images showing the structure rising stage by stage, then combined them with effects, captions, and banners to convey the method from a fixed perspective. This approach, while less detailed, was cost effective, communicated the build sequence and was completed rapidly to meet the bid timeline. Together, these Fiji bridge visuals represented a coordinated attempt to elevate our 4D capability across the company.

[TE-0350 Fiji Bridges 4D call outs V4.mp4](#)



- [TE-0350 Fiji Bridges Viseisei 4D V4.mp4](#)



Image: Examples of 4D visualisations for bridge building.

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Another milestone was the Rolleston Dunns Underpass upgrade. Here, Engineering Services trialled the use of *Twinmotion* to render a more detailed 4D model of the construction sequence. The team started with a reasonably detailed model, after workshops with the bid team and our structures lead we developed a comprehensive 4D timeline of the works. The *Twinmotion* video depicted major activities like staged **culvert installations** with the corresponding plant and machinery appearing in sequence. On-screen labels were motion-tracked to equipment and structural elements to highlight each step and its purpose, and banners were added for clarity. This Rolleston 4D visualisation improved the client’s insight into our proposed methodology—it clearly showed the sequence of works and the benefits of our approach—using a more advanced, realistic medium than earlier attempts.

[TE-0368 SH1 Rolleston Dunns Crossing 4D V5.mp4](#)

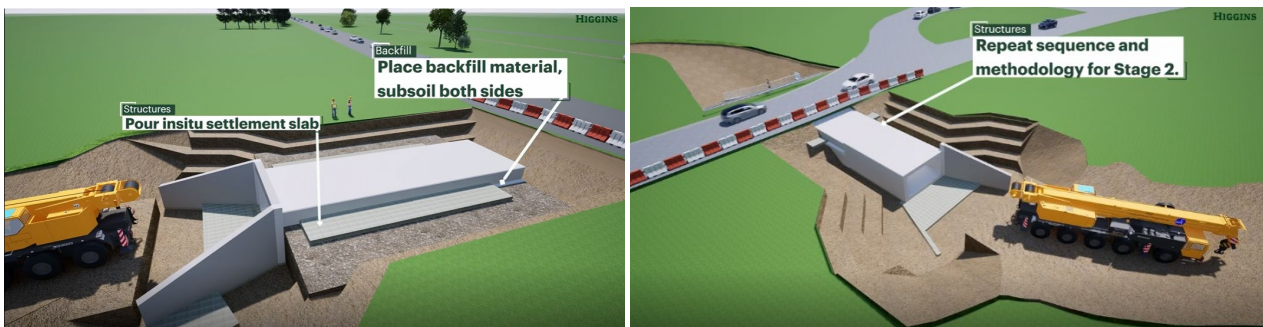


Image: Screenshot showing culvert sequence and phasing across a main road.

2 What Are We Doing Differently?

Our approach to 4D visualisation has evolved dramatically through these projects—essentially moving through **three generations** of capability, each improving on software tools, visual realism, and communication value. Initially, 4D models were fairly rudimentary; now they are high-fidelity simulations integral to how we explain methodologies. Key differences in the latest generation include the use of more powerful software (e.g. switching from Fuzor to *Twinmotion*), greater rendering detail, and an expanded focus on stakeholder considerations and clarity of message.

Recently the BPC team challenged Engineering Services to create an improved 4D visualisation for the upcoming Inga Road Bridge Replacement project. This video now stands as our best offering in the 4D space and will sit as the new benchmark in our capability.

[BPC Inga Road Bridge 4D V2.mp4](#)



Image: Screenshots of BPC 4D video showing improved modelling and temporary works intent

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As shown above, each generation of 4D visualisation has added new dimensions of quality and communication. **Software improvements** (from basic tools to Twinmotion) enabled more complex and lifelike animations. **Rendering and detail** have increased markedly—we now depict real project conditions (different materials, lighting changes, exact equipment models) rather than abstract representations. We are also **engaging stakeholders better** by showing how we will minimise impacts on them: for example, the inclusion of temporary works for public safety and the visualisation of traffic management plans mean clients and the community can literally see how we'll keep them safe and informed during construction. The **way we communicate methodology** has become more sophisticated—moving from static text overlays to interactive, motion tracked, in-context annotations and even time-of-day visuals to convey scheduling intentions.

These advancements in capability mean our bid and project presentations are far more compelling than before. We have gone from simple 3D walkthroughs to delivering polished 4D “digital rehearsals” of our projects. Each iteration has built on lessons learned, with Engineering Services driving continuous improvement so that *each new 4D video is better than the last*. By steadily advancing this capability, we ensure clients and site teams gain a clearer understanding of our methodology and we differentiate ourselves in the marketplace with innovative, visual project communication.

[BPC East Clive WWTP 4D V2.mp4](#) is our most recent example of our 4D capability, with improvements and innovations already noted for the next one, this is an exciting space and positions us as leaders among our competition.



Image: Screenshots of a recent BPC WWTP 4D video used in a bid.

3 More Information

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