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The only way is 3D in AMP6

3D modelling, together with teamwork and innovation, will be key for efficient delivery in this AMP period

Our industry is changing, and we need to adapt and innovate to achieve a new framework for efficient delivery in AMP6. Within two to five years, I believe digital tools and techniques will be integrated into the project delivery process, radically changing how solutions are delivered. Projects will be designed using intelligent models which can be interrogated by all stakeholders long before the construction stage is reached – eradicating rework, reducing time, inefficiencies and cost.

We need to have collaboratively thought through site delivery prior to starting on site: not just understanding the design, but also the most efficient method of delivery. Our construction teams want firm designs so they can keep to a schedule, and designers don't want 11th hour questions like "Who designed it like this?.....I'd build it like this". These questions are great and constructive, but better received at the right time in the process. We now aim to force questions to occur during the optimisation and engineering phases of a project, by planning collaborative meetings between the design, engineering, assembly and commissioning teams as well as operations and other stakeholders. The key concept is that everybody involved in the delivery has 'a say' so the design is owned by everybody, not just the design engineers.

The industry's current design and construct model has inherent inefficiencies, because most work overlaps with the construction plan to ensure pace of delivery is achieved. Early in the

design process the engineers have to base their plans on a huge range of assumptions. We are often a long way into the process before we can check assumptions, make further iterations (if necessary), and give the construction team a view of the design.

Our approach starts with engineering to develop the design for delivery and assembly. Then we identify activities to optimise the design for assembly on site. Next, logistics focuses on how the design will be efficiently deployed for assembly. They provide feedback to the design team to make minor modifications to allow efficient deployment on site. Logistics' focus is to reduce time to assemble the design on site. The focus is on avoiding construction rework, minimising materials wastage and increasing the potential efficiency of the workforce. We use the term 'assembly' to reflect the increased use of off-site manufacture and to reinforce changes in how solutions are delivered. Collaborating with the assembly team gives them the opportunity to influence the design at an early stage, ensuring it is delivered as efficiently as possible. Only when logistics are complete do we go to site and assemble.

Look, no drawings!

A key facilitation tool of the optimisation process is engineering in 3D. Different disciplines can look at an intelligent model and instantly understand the design and its context. The conversation about how to optimise each discipline's solution can start and they can quickly add value. Using intelligent models at targeted meetings means we can snag items, identify aspects of design, efficiencies, reduce clashes and amend before we build. The aim is to eradicate rework and improve delivery flow.

Tools that allow engineers to interact with the model without requiring them to become CAD operators provide a real a step change in approach. The engineers can now interact and work with the model, not just 2D extracts. No need for draft sections or drawings! Viewing the model in virtual reality facilitates collaborative design, enables rigorous checking and speedy clash reporting. Logistics can incorporate construction sequencing and link the schedule to the model and see how it will play out. This allows more scrutiny to be given to the assembly process and helps check we have a safe design to assemble.

The big advantage of working with an intelligent 3D model is we can do all of this without drawings. Initially it may be a challenge to get people interacting with the model rather than drawings taken from the model, but this is where the industry is headed. We need more engineers to adopt this approach. Some training will be needed, but the software is very intuitive. Driven by AMP 6 and the demand for better outcomes, within five years, I predict this is the way we will all be approaching our projects. Engineers should already be thinking in 3D to do their jobs and by incorporating intelligent 3D models, the industry can make a step change in efficiency.

