A clearly defined vision: the Starting point for collaboration, Innovation and project Delivery success

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The successful outcome of construction projects is so often determined at the start. This is well-demonstrated by our three recent Building and Construction Authority (BCA) Awards winning projects – The Scotts Tower, SBF Center and NUS AS8 building. When the client sets out a clearly defined vision, the delivery team will be able to draw on their creativity, analysis, good judgement, and leadership to deliver outcomes that exceed the original expectation.

Any consumer today, whether buying a new car, television, house or a pair of shoes, demands certainty from their purchase. How much will it cost, when will it be delivered, will it meet my needs, and will it work?

The modern construction client is no different. Regardless of the type of project they are commissioning, be it residential, commercial, industrial or infrastructure, they also want certainty of the product's performance, delivery date, cost, and quality.

In both cases, a successful outcome starts with a clear understanding of what you want to buy. For instance, what outcome is sought from the investment, what performance is needed, and what quality is desired.

It sounds simple and obvious, something that we do every day. Yet in reality, the construction sector still falls short of achieving this goal.

So often around the world, we see unsatisfied owners lamenting late, underperforming and over-budget projects, alongside a supply chain that is still struggling with poor productivity, poor margins, and wasted resources.

It does not have to be this way. As demonstrated by the successful projects recognised by the recent BCA Awards, it is possible to create assets that delight clients, underpin reputations, and improve bottom lines of everyone involved.

Solving the right problems_

Setting a clearly defined brief cannot be underestimated. It means the client must take the time to establish and set out its vision for the project. It also means that everyone involved in the design and delivery process must understand and buy into this ambition.

As professional engineers, our passion is to solve problems. A project such as The Scotts Tower, has no shortage of technical challenges to overcome - difficult ground conditions, space constraints, old foundations left behind by a demolished building, the close proximity of underground MRT tunnels,

and the architectural ambition to construct slanted columns to support the building's 30 floors.

The key challenge is to ensure that from the very start of the project, each of these technical challenges - the exciting problems we love to solve – are actually relevant to the client's vision. If it doesn't, or if it hinders progress towards that vision, then, regardless of the technical achievement, it is not the right problem to solve.

For example, minimising the sway of the SBF Center, a slender tower, was critical for occupants' safety. Our team worked hard to optimise the performance of the basic skeletal structures using innovative ideas to resist sway from the very start of the design process, rather than simply deploying additional active mechanical damping systems that require maintenance and cost in the long run. Linking this largely unseen work back to the client's vision of overall cost-effectiveness with the fitness of purpose throughout its full life cycle is critical to building confidence in their investment.

Creating the culture of collaboration_

Setting out and understanding a clear brief is also the fundamental pathway for any project to establish an effective, motivated and collaborative supply chain throughout the project delivery. If every member of the delivery team understands what the client is trying to achieve, his role, and how he interacts with the rest of the team, it contributes to the vision being realised.

This collaborative approach established and maintained by regular meetings, and having a shared culture with the others across the project, is crucial to ensuring that the multiple interests and often competing demands are effectively addressed. In short, true collaboration helps the team and the client to agree on "what will work best"? This implies finding the right solutions that will best achieve the client's vision for the project and also enabling the skills and capabilities of the supply chain to be effective and efficiently mobilised.

Collaboration is, after all, about working together for mutual benefit. Decisions or solutions that fail to embrace the competing demands of the entire team are unlikely to deliver sustainable results.

Our work on the NUS AS8 building saw a huge amount of rigorous design and robust detailing by engineers in collaboration with the construction team and the architects - creating a buildable structural frame that could not only resist huge lateral earth loads from the sloping ground but also achieve the architectural intent of discontinuity in space volumes.

Only through deep collaboration across the team from the start can this complex web of competing needs be addressed satisfactorily.

Technology as the enabler for the better design solutions_

Of course, none of today's increasingly complex and technically challenging projects would be possible without huge investment in innovation and digital technology. The advent of 3D design tools and Building Information Modelling made possible today by technology is what we could only dream of in the past.

On the Scotts Tower project, the design of the novel "outrigger" transfer system to mobilise the stiffness of the central spine core walls using a pair of splayed balanced cantilever fin beams connected to secondary tie beams on four inclined mega columns would not have been possible without modern design tools.

Similarly, the design and planning for the hybrid, cost effective foundation solution for the SBF Center using both piling and a ground bearing raft foundation to work around the constraint of historic underground pile obstructions, would have been difficult if not impossible without digital technology.

However, while leveraging digital technologies is crucial for better efficiency and to accelerate the delivery of creative solutions, it is vital that the power of these tools does not lead professional engineers towards the wrong solution. Once more, a reference to that clearly established vision for the project is crucial to aligning the team's knowledge, experience, and technology to deliver the desired project outcomes.

Surbana Jurong engineers scoop BCA Awards_

Surbana Jurong engineers Aaron Foong Kit Kuen and Allan Teo Kok Jin were recognised by the Singapore Building and Construction Authority with the top award for creative engineering solutions[1]. An unprecedented scoop of all three Awards made across the Residential, Commercial Building, Institutional & Industrial Building category, saw Aaron and Allan, both of Surbana Jurong's subsidiary, KTP Consultants Pte Ltd, rewarded for innovative engineering solutions which overcame project challenges for safe designs and construction[2].

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[1] The Building and Construction Authority (BCA) of Singapore's annual awards are made to a small number of professional engineers each year to recognise engineering excellence as part of its work to champion the development of an excellent built environment for Singapore.

[2] Aaron was handed an Award in the Residential category for his work on the complex 30 storey Scotts Tower and in the Institutional & Industrial category for the National University of Singapore AS8 building. Both featured complex ground conditions and challenging structural forms to overcome. Allan was also recognised with an Award in the Commercial for his work on the SBF Center project Singapore Central Business District, which at 184m tall, has a floor plan width of only 20.2m and a slenderness ratio of 9.1.