Value Engineering Case Study

External Canopy Design Improvements

Executive Summary

With the standard design for an External Canopy resulted in excess Construction cost, within a national program to deploy the design to facilities in all states, the opportunity was taken to Value Engineer (VE) the Design. The project identified waste and excess, which could be eliminated without compromising the design intent or function, and acted as a catalyst to introduce innovations to further reduce cost.

The VE project reviewed the design in collaboration with Design, Construction and Quantity Surveyor colleagues. The VE solutions that were endorsed by the Project Team received Governance Approval to update the Standard Design - to deliver the following improvements;

- **Value Creation** through the inclusion of Value Engineered innovations, and the elimination of identified waste and excess, allowing the revised Standard Design to achieve a **cost reduction of *>$66k per project, or $8.8M p.a.***

Solution Integrity checks throughout the project saw some initial opportunities dismissed. The Approved opportunities resulted in ***No*** compromises to the function nor intent of the Canopy design – with the only cost being the time taken by the Project Team to complete the Review!

Value Engineering Case Study

External Canopy Design Improvements

Background – The standard design for an External Canopy had experienced scope-creep, where aesthetic, innovative and design features produced an outstanding structure – though proving more costly than expected. With a national program underway to deploy the design to facilities in all states, the opportunity was taken to Value Engineer (VE) the Design, to eliminate waste and excess, without compromising the design intent or function.

Value Engineering Opportunity – The VE project reviewed the design in collaboration with Design, Construction and Quantity Surveyor colleagues. Key assessments included; Core requirements Vs. Current Design, identifying key opportunities, and recommending specific and achievable improvements. The (inherently costed) Recommendations that received endorsement from the SME team and stakeholders then progressed for formal assessment via a Governance process, to gain approval to update the Standard design.

Opportunities & Benefits – The design review assessed both the Structure, and its Surrounds. Of the many options identified and initially assessed, the Subject Matter Expert (SME) Team and stakeholders endorsed the following options as the Key VE opportunities;

Canopy Structure;



- **Structural Columns –** Reduced from the original (Aesthetic-driven) size, to that required structurally. *The option to use cladding to increase size to match the originals, was found unnecessary*
- **Aesthetic Battens –** Changed to a specific “Off the Shelf” metal tube Aluminium tubing was chosen as despite having a higher capital cost

than an equivalent Steel tube, its weather resistant characteristics saw lower maintenance costs, ie a lower net Total Cost of Ownership

- **Canopy Height –** Reviewing the original design height against the expected traffic mix (excluding high trucks), allowed a reduced height. This reduced Column and Batten meterage, to further reduce cost
- **Roof Structure –** Assessed that the semi-rigid characteristics of Composite Panels, which require less supporting steelwork. This proved more cost effective than the original use of lightweight metal sheeting over a structural frame – while retaining structural integrity
- **Roof Panel Costs** – Collaboration with the Composite Panel supplier determined the optimum (cost) balance of Panel thickness Vs Steel framework required. Extrapolating the quantities of Panels required to support the annual installation program allowed negotiating a more favourable ongoing cost to introduce the new panel material

Canopy Surrounds;



- **Concrete Kerbing –** Completely eliminated in favour of Flush Kerbing at interfaces with Asphalt. This also improved (Safety) Risk, by eliminating Trip Hazards, and issues with inclined ramps!
- **Concrete paving** – Reduced by >200m2 per project, through the substitution of Mulch wherever possible, and reducing necessary pathways from full-width to 2m
- **Roof Area** - The reduction in path width also reduced the total width that the Canopy needed to cover. This allowed a reduction in the total roof area that – also reducing the quantities of Roof materials
- **Island Strip Footing** – Combined Paving and individual Footings for each Column, and made these flush with surrounding Asphalt, to eliminate requirements for separate Paving and Kerbing
- **Collision Bollards** – Liaised with suppliers to add a cheaper “Minor-Risk” Bollard (and lighter concrete footing) option to the Standard, for demarcation of non-trafficable areas. These allowed the quantity of expensive and larger High-Risk Bollards (with deep footings) to be reduced significantly, to protect Ram-Raid risk points only - rather than every Bollard location

Results

- **Final Recommendations** (above) were individually justified based upon their incremental savings, in the absence of any design intent or functionality impacts - and achieved Governance approval to revise the Standard Design
- **Value Creation** through the inclusion of Value Engineered innovations, and the elimination of identified waste and excess, saw the revised Standard Design achieve a **cost reduction of *>$66k per project, or $8.8M p.a.***

Value Engineering Pillars – *The VE project outcome was achieved through application of* All 5 of the Value Engineering Pillars;

- Design Optimisation through understanding the application and design objectives, then refining the Canopy and its Surrounds to include innovative Value Engineered solutions eg Reducing height and width of the roof
- Substitution to assess established convention against viable opportunities ensure that the most functionally and cost-effective technologies were included eg introducing the Composite Panel Roof construction opportunity
- Quantity Rationalisation to ensure the design and Bill of Materials inherently minimises quantities, to eliminate waste and excess eg reducing Concrete Paving by >200m2 per project
- Sourcing opportunity presented through the introduction of Composite Roof Panels. The annual quantities required Construction program allowed the negotiation of Win:Win pricing to introduce the new material
- Solution Integrity checks at *each* step of the Value Engineering assessment, involving the SME's and Stakeholders, assured that the Recommendations avoided *Any* compromises to the function or intent of the Canopy design!

Uptimise Consulting Pty Ltd
m +61 (0)410 458 059
e mike@uptimiseconsulting.com.au
w uptimiseconsulting.com.au
p PO Box 347, Castle Hill 1765, Australia