

## David Beneke Consulting

Finite Element Analysis for Engineering

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# STATEMENT OF CAPABILITY

David Beneke Consulting is a consulting firm with specialist skills in Finite Element Analysis (FEA) and Research and Development of manufactured building products.

## Finite Element Analysis

Our skills in the field of FEA are underpinned by 35 years experience in the use of FEA software such as Strand 7, MSC.FEA (Patran/Nastran) in projects which are primarily of a structural engineering nature. A summary of analysis work in which significant experience has been developed include:

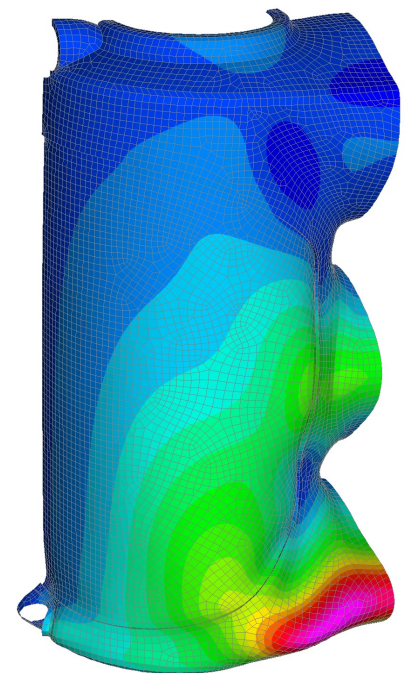
- Steel storage racking including selective, drive-in/drive-through, satellite and cantilever
- Rotationally moulded plastics including water storage tanks (above and below ground)
- Injection moulded plastics
- Carbon fibre strengthening of existing reinforced concrete structures.
- Bins and silos
- Expert opinion for litigation

Incorporating the following analysis types:

- Linear static with linear material
- Non-linear static incorporating geometric, material and boundary non-linearity (or combinations of all three)
- Natural frequency
- Frequency domain harmonic
- Spectral response including earthquake and power spectral density
- Linear and non-linear transient dynamic including impact analysis
- Steady state and transient thermal
- Material optimisation

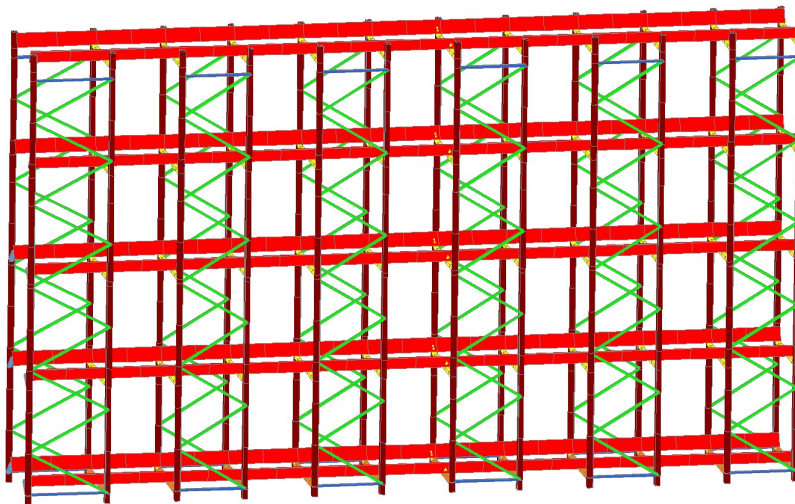
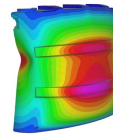
Using various material types including:

- Light gauge steel
- Stainless steels
- Aluminium alloys
- Fibre composites
- Plastics
- Concrete – both reinforced and un-reinforced
- Masonry
- Autoclaved aerated concrete (AAC)

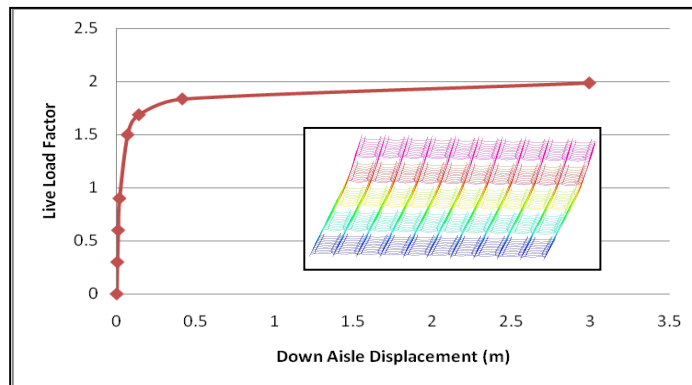


Transverse deflection plot of a polyethylene slimline water storage tank - non-linear geometric analysis

Our primary strength in terms of our analytical work is to provide design solutions when deficiencies in the analysed item are identified. Given our experience in the manufacturing industry, multiple solutions to these deficiencies can be offered, then tailored to the specific manufacturing process with consideration for the associated impacts on manufacturing cost.



Typical Bay of a satellite pallet racking system with down-aisle non-linear global buckling curve and mode shape (inset)



## Research and Development

In terms of research and development, one must understand the critical role that engineering takes in the development of any product. Careful planning is required in order to achieve the minimum time from product inception to manufacture and sale. The specialist skills that we offer revolve around:

- Initial engineering development planning including project staging
- Development of experimental test regimes
- Inspection and witnessing of experimental tests
- Development of span tables, design guides and reference material
- Structural certification including Form 15 (QLD), Form 1507 (VIC) and Form 40 (NT).

## Contact Details

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