ACE ENGINEERING GROUP

CAPABILITY STATEMENT

Structural and mechanical engineering for bulk handling machinery

ACE helps asset owners, equipment manufacturers and engineering firms develop machine designs, assess upgrades and define repair work. We provide structural and mechanical calculations, assessed options and practical recommendations for design, procurement and maintenance decisions.

Stackers · Reclaimers · Shiploaders · Ship unloaders
Associated conveyor systems



Engineering packages you can commission

Service	What the work provides
New machine design	Structural and mechanical calculations, component requirements and design interface actions.
Machine FEA and assessment	Analysis models, assessed loading conditions and recommendations for the machine.
Independent FEA peer review	Review of another party’s model and calculations, with findings and response stages.
AS 4324.1:2025 review	A gap study and prioritised actions, with design, cost and programme comparisons where agreed.
Modifications and major maintenance	Assessment of changed loads, temporary supports and the design work required.
Inspection, fatigue and repair	Condition findings, investigation of recurring damage and defined repair priorities.

Discuss your project | Perth, Western Australia

DESIGN AND REVIEW

Design and independent review

New machine design and FEA

ACE develops structural and mechanical calculations and finite element analysis (FEA) models for new machines and upgrades. Assessments connect structural capacity with balance, stability, mechanisms and support loads. Outputs include the design basis, calculations and actions for design development.

Independent FEA peer review

ACE reviews another party's model, calculations and design information. The scope addresses assumptions, loads, modelling methods and conclusions, with documented findings, review of responses and outstanding items. This is a separate service from developing an analysis model.

AS 4324.1:2025 Design and Commercial Impact Review

A scoped gap study compares the earlier design basis and available evidence with applicable 2025 requirements. ACE identifies what may be retained, what needs further verification and what requires redesign. The review separates edition changes from existing obligations, client requirements and missing information.

A prioritised register links findings to connected systems, options, responsibilities and closure evidence. Where included in the agreed scope, cost drivers and programme exposure are assessed using available OEM, supplier and client inputs. Assumptions and unpriced items are identified.

WORKING WITH ACE

Scope and engineering outputs

1 Establish the machine and project requirements

Identify the machine configuration, proposed work, available records and next project milestone. Agree the assessment boundary, inputs, deliverables, interfaces and review cycles. Where the information is immature, an initial paid scoping stage can define the work.

2 Assess the behaviour and develop options

Review the design basis and machine condition, undertake the agreed calculations and compare practical responses. Explain how each option affects connected equipment, supports, maintenance and further design work.

3 Deliver findings and support the next stage

Provide the agreed calculations, assessment report, design or repair details and action register. Identify unresolved items, required evidence and responsibilities. Detailed modelling, iterative redesign and responses to external review are scoped for the engagement.

ACE undertakes defined engineering packages with an agreed programme and budget. Personnel, specialist inputs and checking arrangements are confirmed for each engagement. Where ACE develops a solution, independent verification is arranged separately where required.

ACE ENGINEERING GROUP

OPERATING MACHINERY

Define the work needed for repair and continued service

Incomplete records, recurring damage and limited shutdown access can make repair planning difficult. ACE combines inspection findings, operating history and engineering assessment to identify the work required and the information needed to resolve uncertainty.

Inspection and fatigue investigation

Assess condition, corrosion, cracking, previous repairs and changes in operating duty. Investigate the load path and likely damage mechanism to develop repair or strengthening details, inspection priorities and recommendations for further assessment.

Modifications and major maintenance

Trace changes in equipment mass, torque and duty through the machine. Assess the affected structures, mechanisms, stability and wheel or support loads. For component replacement, define jacking reactions, temporary supports, local capacity and the engineering requirements for the load transfer sequence.

Connect the assessment to the maintenance plan

Client question	Engineering output
Why does the crack return?	Assessment of the likely mechanism, loading, connection detail and previous repairs, with recommended action.
What work should we prepare?	Prioritised repair or strengthening scope, required inspection information and unresolved design items.
What fits the shutdown?	Engineering inputs for access, temporary works, installation sequence and further checks needed before execution.
How do we plan around replacement?	Comparison of technically acceptable repair and intervention options against the intended replacement date and the consequences of delay.

Cost comparisons use owner supplied maintenance, shutdown and production inputs. Forecasts identify their assumptions and are updated when inspection findings, operating duty or replacement dates change.

Check the model against the machine

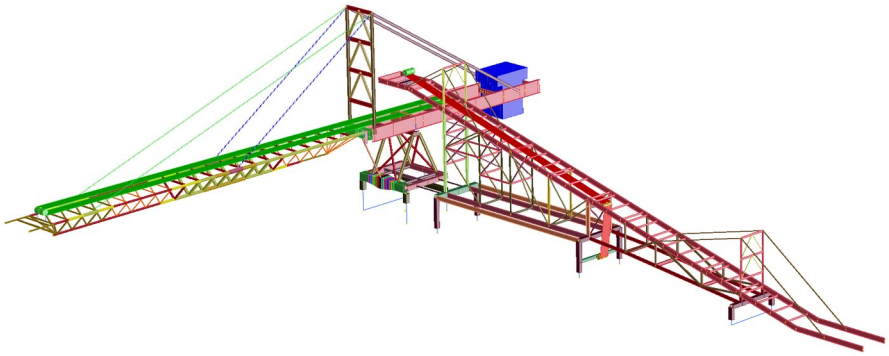
Where relevant measurements are available, ACE compares model predictions with luff trends, SCADA records and other machine data, and investigates discrepancies. Test conditions, loading and the assessed machine configuration form part of that comparison.

Explore all engineering services

ACE ENGINEERING GROUP

Selected work for ACE Engineering Group

Linear stacker



Structural analysis model of the linear stacker and tripper during design development.

ACE supported the equipment manufacturer and project delivery team with structural and mechanical calculations, whole machine assessments and an AS 4324.1:2025 gap study.

The work assessed stability, wheel reactions, luff cylinder forces, long travel requirements and buffer loads. The gap study identified design basis clarifications, recommended technical specification changes and further assessment needs.

ACE provided recommendations and an action register for the OEM's detailed design. Outstanding design and verification items were identified for the next project stages.

Read the linear stacker project example

Corroded bucketwheel assessment

Anthony Nguyen carried out the bucketwheel structural assessment for Beta International Associates (BIA), the lead engineering firm.

The work considered the recorded condition of the bucketwheel, available thickness measurements and assessed loading. It addressed structural capacity, fatigue concerns and local repair requirements, providing engineering recommendations for BIA's client advice.

Read BIA's published project summary

Technical leadership



Anthony Nguyen

Director and Principal Engineer
MIEAust · CPEng · NER · RPEQ

Anthony leads ACE's engineering work from scope definition to technical review and delivery. His experience in previous OEM design and third party audit roles informs ACE's assessment of new designs, operating machines and planned modifications.

View profile and engineering CV

Discuss your project

Send ACE the machine type, proposed work or observed problem, available drawings and records, and the next tender, procurement or shutdown milestone.

anguyen@aceenggroup.com.au | **+61 415 433 395**

aceenggroup.com.au/contact

Capability statement | Revision 4 | 17 October 2026