



Engineering

*Capability Statement*



# About Us

Engenium is a progressive Project Delivery company servicing the resources, rail and infrastructure sectors.

Our clients include some of Australia's blue-chip and mid-tier mining houses, such as Rio Tinto, BHP, Newmont Mining, Nickel West, Alcoa of Australia, CBH Group and Fortescue Metals Group.

Our goal is to help you increase the financial value of your company's assets. We do this by:

- Proving project viability through Feasibility Studies.
- Fast tracking projects into production to generate cash flow.
- Debottlenecking and improving plant efficiencies to increase production and reduce operating costs.
- Representing you (the client) to maximise your project investment.
- Extending production through Brownfield expansion and maintenance projects.

Founded in 2003 to focus on project delivery, Engenium has developed a reputation for responsiveness, flexibility and successfully delivering value to our clients.

Today, Engenium continues to build on its core competencies and is providing valued Project Delivery Services to a diverse range of resources, rail and infrastructure clients.

# The Engenium Difference

Engenium's core strengths are in Engineering Design and Project Delivery Services.

Engenium maintains a pragmatic and whole-of-project outlook from Study through to Design and Execution. Subsequently, Engenium offers a range of services that meets your projects varying needs throughout the various phases of its life-cycle.

We work on the principles of "Smart Project Delivery" to help you meet your business objectives. In providing "Smart Project Delivery", we provide:

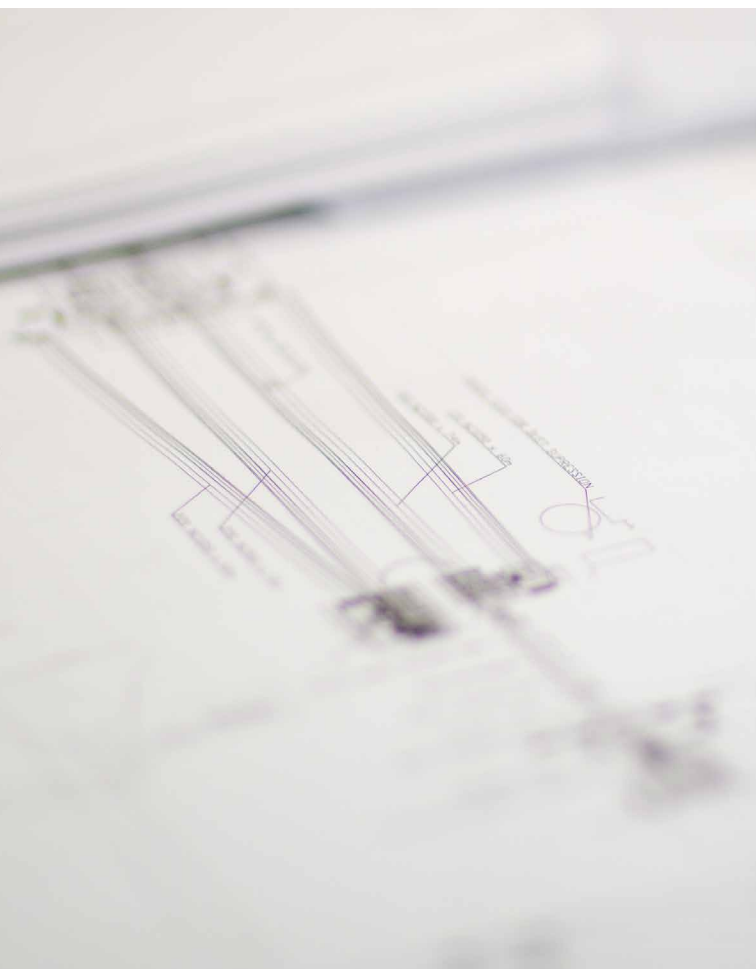
- **Value and Results**  
We treat your capital as if it were our own and ensure the best outcome is derived from your investment.
- **Responsive and Flexible Approach**  
We are able to respond quickly and scale our approach to meet your needs.
- **Project Excellence**  
We are focused on meeting scope, schedule and budget objectives whilst providing the necessary levels of quality, safety and environmental management.
- **Complete Lifecycle Perspective**  
We maintain a pragmatic and whole-of-project outlook incorporating practicality, constructability and maintainability into our projects while offering a single point of contact.
- **Relationship Development**  
We are committed to delivering outstanding project success to earn your repeat business.

Engenium strive to deliver projects using the model best suited to your needs.

Historically, Engenium has been engaged as an integrated team, owners engineer, owners project manager, project management contractor, EPCM provider, design engineering consultant, commissioning manager and as part of a construction led EPC or D&C delivery team.

Your project will benefit from our deep understanding of delivering multi-disciplinary Engineering Design and Value Engineering. Successfully taking designs from study into execution and operation.

We employ technical and design experts in the Process, Civil, Structural, Mechanical, Piping, Electrical, Instrument and Control Systems, Rail and Environmental Engineering disciplines. We also leverage the latest in engineering design software, 3D modelling and BIM systems to improve efficiency and provide you with greater value.





# Engineering Approach and Systems

## LEAN DESIGN AND LEAN ENGINEERING

Over the past 10 years Engenium has embraced and pushed Lean Design and Lean Engineering principles through its “Smart Project Delivery” philosophy.

As all of our clients have differing business requirements, Engenium has applied various Lean Design initiatives to meet individual needs. Generally project design has focussed on low cost, high performance plant and equipment.

Our junior clients tend to have a low capital and operating cost constraint. Subsequently, Engenium’s design initiatives ensure they have fit-for-purpose technical solutions that meet their production targets and dates whilst meeting minimum design standards and legislative requirements.

More mature clients, such as BHP, have a higher level of documentation standards. In these instances Engenium’s Project Team look to work with the client teams to challenge these requirements and ensure that an appropriate solution is delivered without “over engineering” or “gold plating” the solution.

Engenium’s innovative engineering solutions, mean your project will benefit from:

- Less Engineering hours through the use of our plant engineering and 3D design tools and processes.
- A collaborative approach to project execution planning, to ensure Engineering effort matches the

key issues on the execution plan.

- Challenging acceptable standards to ensure “fit-for-purpose” design and value for money engineering.
- Minimising the quantity of drawing deliverables produced whilst still ensuring the ability to gain good technical understanding of the project and construction pricing in execution.
- Fast tracked, minimal design for construction tendering purposes.
- Safety-in-design incorporated throughout our design processes and methodology.
- Utilisation of standardised or “off the shelf” plant and equipment in the design to reduce re-engineering and custom engineering where there is low value add to the project.
- Design for off site fabrication, modularisation, transportation and pre-assembly.
- Incorporation of constructability reviews and minimising construction hours on site through smart design and appropriate contractor interaction.
- Greater design review and construction productivity, through the utilisation of 3D modelling tools for visualisation by Client teams and Contractors.

### Client

BHP Billiton Iron Ore

### Title of Project

Outflow Sample Station Plant Upgrades

### Capital Value

AU \$82 Million

Engenium was appointed to complete a definition phase study, including detailed design and shop detailing, for the BHP Billiton Outflow Sample Station Upgrades project.

The sample stations designed by Engenium formed part of the North Yard and South Yard shiploading circuits at the port. The objective of this project was to provide the client with a robust design and cost estimate to allow the project to tollgate into execution, handing over detailed drawings to the contractor and fabricator once the execution funds were released. Due to the installation of the sample stations being shutdown dependent there was a strict timeline for the work to be completed which Engenium successfully met.



### 3D DESIGN PROCESS DETAILS

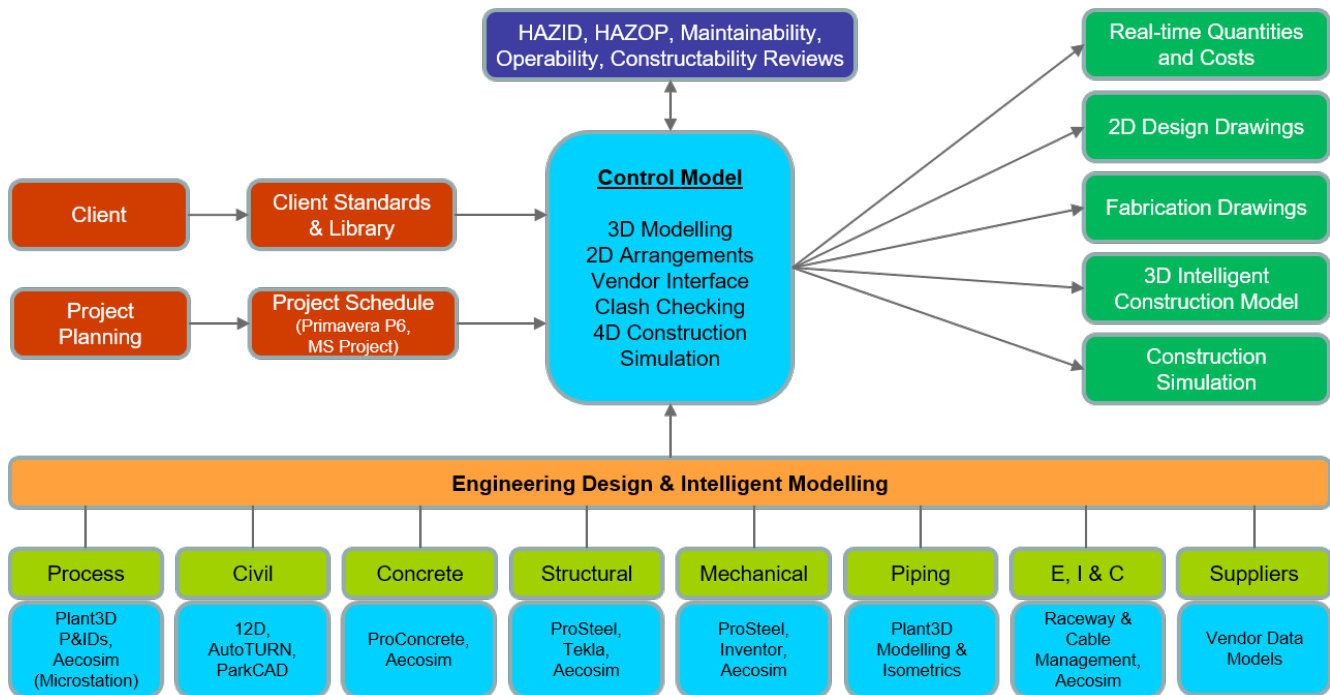
Engenium's design methodology has been developed to meet critical project schedules. This methodology has been developed to support a fast track design and construct, where the engineering deliverables are minimised and the focus is on deliverables to support fabrication and construction.

The 3D intelligent arrangement model is the central tool to coordinate the efforts of all disciplines and communicate project progress.

Engenium undertakes traditional review and approvals processes, whereby the 3D Model in a Navisworks format is published weekly and utilised as the review and approval tool.

Weekly design review meetings are undertaken to review and approve the design and document design actions for incorporation. In this way only a limited number of 2D deliverables would be signed off for approval during the design development phase including:

- Basis of design.
- Discipline design criteria.
- Technical specifications, such as pipe and valve specification.
- Process Flow Diagrams.
- Mass Balance.
- Piping & Instrument Diagrams.
- Equipment Data Sheets.
- Instrument Data Sheets.
- Engineering Lists.
- General Arrangements.



This process allows the design to progress rapidly and feed the contractor without the schedule delays from the drawing production and approval process.

Engenium embraces the following overarching methodology to support expedient delivery to schedule:

- Establish the design basis.
- Establish deliverable list and target dates for client sign off.
- Establish design review dates and agendas.
- Prioritise resolution of process, required equipment and establishment of layout for the project.
- Undertake early engineering to support early site establishment, earthworks, civil works and concrete works.
- Undertake steelwork engineering, platework engineering, piping engineering, shop detailing and isometric detailing in parallel to support progressive release of shop details for fabrication.
- Progressively develop the electrical and instrumentation design to support the purchase of key supply items and interfaces with steelwork.
- Undertake design reviews with the client on a regular basis to review progress.

Engenium use a range of software to assist design, as shown below:

DISCIPLINE	ENGINEERING	INTELLIGENT DESIGN
Process	MS Excel, LIMN, Bruno, Plant Designer	Open Plant PID, Plant3D P&IDs, Aecosim (Microstation)
Civil	12D Drainage, HEC-RAS	Open Roads, 12D, AutoTURN, ParkCAD
Concrete	STAAD Foundations, TEDDS	ProConcrete, Aecosim
Structural	SpaceGASS, LIMCON, STAADPro, Strand7	ProSteel, Teklastructures
Mechanical	Beltstat, Helix Delta T, Inventor/ Solidworks (FEA)	ProSteel, Inventor, Aecosim
Piping	WaterGems, Hammer, Autopipe, FluidFlow 3, Caesar II	Open Plant Modeller, Isometrics, Supports, Plant3D Modelling & Isometrics
E, I & C	PowerTools (PTW), PowerCAD, Autogrid, Dialux	Raceway & Cable Management, Promis.e, Aecosim, Bentley Instrument & Wiring

#### STEELWORK / CHUTE AND LAUNDER DESIGN AND DETAILING

Engenium utilise Prosteel - an intelligent shop detailing package - to undertake the design and shop detail modelling and produce the shop detail drawings, associated lists and dxf/nwc files. This approach allows Engenium to progressively release shop details to the fabricator to support early delivery to site.

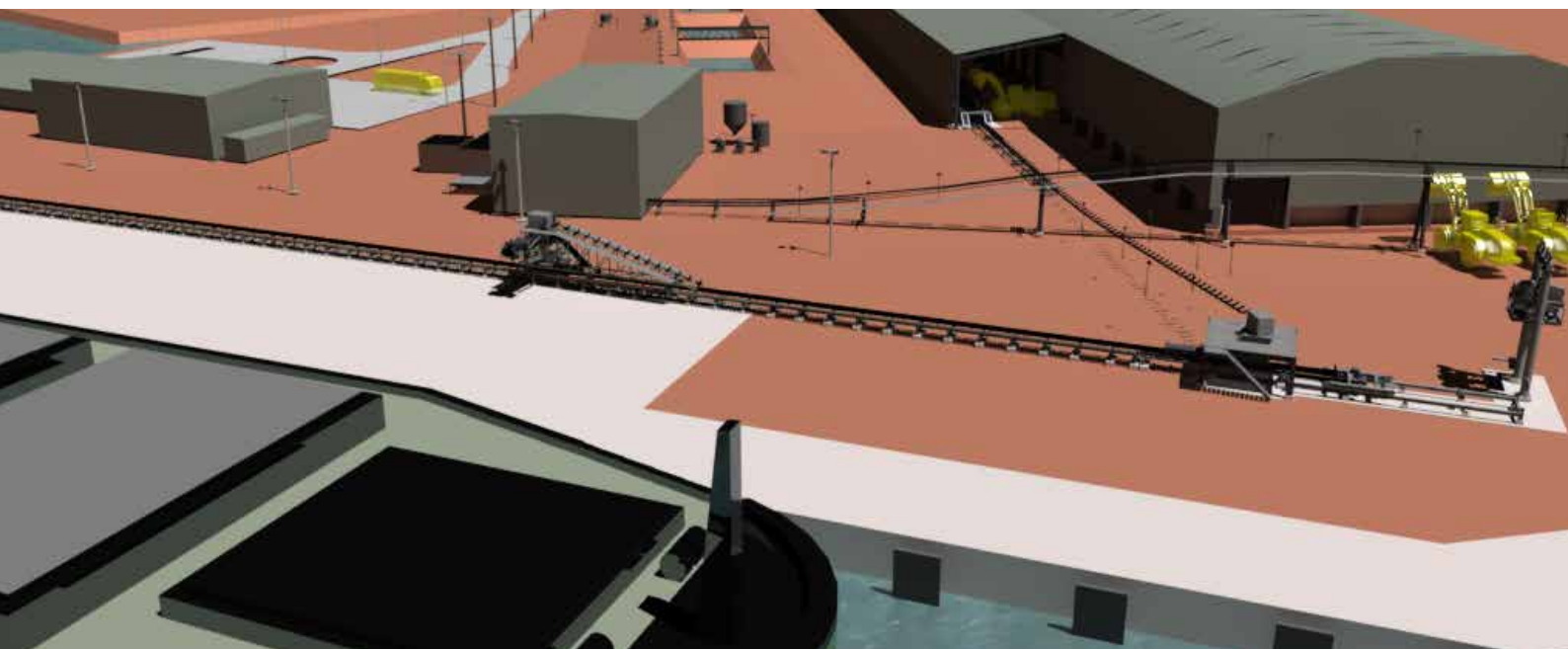
#### RACEWAYS / CABLE MANAGEMENT DESIGN AND DETAILING

Engenium utilise Raceways - an intelligent design package - to undertake the design modelling and produce the cable tray schedule and associated reports. This approach allows Engenium to progressively release tray and cable requirements to the supplier to support delivery to site.

#### PIPING DESIGN AND ISOMETRIC DETAILING

Engenium utilise Plant 3D - an intelligent piping design and detailing package - to undertake the P&ID's, the piping spec building, the design modelling, and produce the piping isometric drawings and associated lists. This approach allows Engenium to progressively release piping spools to the fabricator to support early delivery to site.

Below: Amex MBA Iron Sands Project



# Project Delivery Systems

Our fully Integrated Management System (IMS) consists of a series of policies, management plans, procedures, forms and templates to cover all aspects of our services.

Engenium's systems have been independently verified by SAI Global as complying with the requirements of ISO and AS/NZS management system standards and has received certificates of registration for the following:

- ISO 9001 Quality Management Systems.
- ISO 14001 Environmental Management Systems.
- AS 4801 OHS Management Systems.

In addition, the IMS has been designed to ensure all of our processes take into account the risk management principles of:

- ISO 31000 Risk Management – Principles and Guidelines.

*Catalyst*, Engenium's Project Delivery system, allows Engenium to uniquely scale our approach to meet the needs of the emerging producer through to the robust requirements of the blue chip organisations. It allows Engenium to customise our project delivery to meet the budget, schedule, design, OHS, environmental and quality requirements of each individual client.

Engenium is committed to excellence in the management of all health, safety and environmental matters and accept that our Clients, our employees, suppliers and the communities in which we operate have the right to expect safe, environmentally responsible and sustainable performance from us.



## Client

Norton Gold Fields

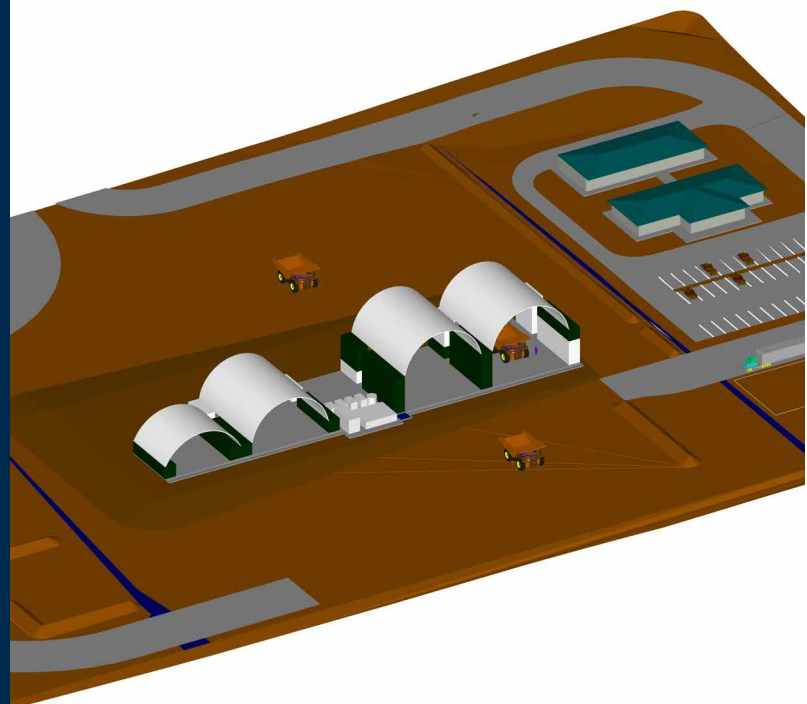
## Title of Project

Enterprise Mine Infrastructure

Engenium was appointed to provide EPCM services for the design and construction of mine infrastructure and associated facilities, including a maintenance workshop, admin building, car part and services such as power, communications, portable water, fire water and waste water.

Norton Gold Fields has a number of mining operations in the Kalgoorlie area supplying ore to the Paddington processing plant located north-east of Kalgoorlie.

The new Enterprise mine will supply ore to the Paddington plant. The key objective for the client was establishing infrastructure and facilities for mining operations that were targeted to start in a very short time frame.





# Metallurgical Testwork & Process Engineering

## Process Engineering Consultants: We Determine A Cost Effective Solution.

Engenium's Metallurgical Testwork and Process Engineering service will determine the most cost effective processing solution for your mining project, giving you early visibility on the projects potential.

We employ recognised experts in Metallurgical Testwork and Process Engineering. Our engineers can help you to understand the metallurgy and ore characteristics of your resource and your potential ore products.

Our experienced Process Engineering team will simplify this practice for you by developing, budgeting and scheduling the metallurgical test plans and sampling requirements.

## Management and Coordination Of Metallurgical Testwork.

We can manage and coordinate the test program with the labs, interpret the results and deliver a metallurgical summary report to you. This key step is essential to developing a process flow sheet that is practical, cost-effective and delivers maximum yield for your project.

Our experience includes commodities such as:

- Iron Ore
- Manganese
- Mineral Sands
- Copper

- Nickel
- Diamonds
- Coal
- Gold and other precious and base metals.

We have proven experience in the following key capabilities:

- Testwork program development including head assays, Davis Tube Recovery tests for iron ore, comminution tests and bench scale tests for various beneficiation processes.
- Coordination and management of metallurgical testwork.
- Evaluation of the testwork results.
- Validation of any prior testwork programs.
- Recommendation of the optimal processing particle size.
- Conceptual development of flow sheets for processing.
- Determination of recovery rates and operational usage of consumables and reagents.
- Determination of process plant layout and size.
- Establishment of the operational sampling and analysis criteria.
- Process design.

### Client

Fortescue Metals Group

### Title of Project

North Star Early Ore Project

### Capital Value

AU \$65 Million

The purpose of the study was to produce sufficient documentation to enable an investment discussion and decision on the future of the project in October 2013. The work centred on developing the documentation to supply a +/- 25% capital cost estimate in the time allowed.

To support this investment decision a report was compiled to include basis of design for project, process flow diagrams, mass and water balance, 3D model of the plant, mechanical equipment and electrical load list, layout drawings and footprint, execution schedule, high level risk analysis and capex and opex budget estimates.



# Process Plants

## Process Plant Design and Optimisation

Engenium has significant experience in Process Plant Design and Optimisation across a range of commodities and mineral types. Our specialists have the expertise in designing Process Plants for a variety of materials.

This expertise ranges from simple crushing and screening circuits to more complex processing plants. Particularly where beneficiation is required through various forms of separation such as gravity, flotation, magnetism or leaching.

Our Process Plant Design and Optimisation experience includes the following commodities and mineral types:

- Iron Ore Processing (scrubbing, jigging, cyclones, classifiers, spirals and fitters).
- Manganese Processing (dense media separation).
- Mineral sands Processing (heavy minerals separation).
- Nickel Processing (grinding, flotation, thickening, filtration).
- Copper Processing (flotation).
- Diamonds Processing (grinding and dense media separation).
- Coal Processing (wash plant).
- Gold Processing (grinding, CIL, heap leach, gravity circuit).
- Other Precious and Base Metals.

We understand the basis for all mining project development is the production of a good Process Flow Diagram. Engenium can assist you in developing a robust flow sheet for your process plants requirements.

Engenium's team of experts will determine your ore's performance through Metallurgical Testwork performed to suitable standards and test plans. We will help you determine the product grade, recovery and size of the process equipment you need.

We utilise a variety of the latest 3D modelling software for each project phase from as early as conceptual design. This integrated approach to engineering helps us to coordinate disciplines, maintain accuracy and improve efficiency in design.

We can also assist with the optimisation, commissioning and handover of the working plant.

Our Process Plant capabilities include:

- Conceptual development of Flow Sheets for processing.
- Determination of recovery rates and operational usage of consumables and reagents.
- Determination of process plant layout and size.
- Establishment of the operational sampling and analysis criteria.
- Capital and Operating Cost Estimates.
- Process Plant Design.
- Detailed Design.
- Shop Detailing.
- Project Management.
- Commissioning.
- Operations Support.

# Materials Handling Solutions

## Materials Handling Solutions From Mine to Port

Iron ore, coal and bauxite mining operations rely heavily on bulk materials handling equipment to deliver the product from mine to port. We have a range of disciplines to provide you with the necessary Materials Handling Solutions including; Mechanical, Structural, Electrical, Piping, Instrument and Process.

Our understanding of the end-to-end supply chain including Processing, Handling, Storage and Transportation ensures we provide you with efficient and functional designs for your materials handling process.

Our Materials Handling Solutions include experience in:

- Truck Dump Receipt.
- Rail Car Dumpers.
- Conveyors and Feeders.
- Hoppers, Transfer Stations and Sample Stations.
- Shiploading.
- Logistics, including Road, Rail and Slurry Pipelines.

Our capabilities include:

- Design and assessment of specifications for port infrastructure at the conceptual through to detailed level.
- Inspect and report on existing port infrastructure.
- Prepare reports on the standards of service delivery.
- Make recommendations on any improvements that a port may require, such as sidings and bulk commodity loading facilities.
- Assist with the preparation of study reports, approvals and regulatory requirements.
- Assessment of operational service standards
- Assessment of new facilities investment (capital expenditure and construction costs).
- Assessment of costs relating to technical operating matters (operating expenditure), review and approval of operational documents such as the train management guidelines and train path policies.
- Review, analysis and development of operational documents.



# Mechanical Engineering

## Mechanical Engineering Consultants: Offering Advice and Solutions

At Engenium we provide professional consulting advice and solutions in Mechanical Engineering, Mechanical Design, Drafting, Machine Health and Condition Monitoring, Vibrational and Structural Monitoring of machines, and Vibration and Model Analysis.

While our staff have many years of experience we retain a fresh, up-to-date approach to technology by remaining on the leading edge of Mechanical Engineering solutions. We have experience in lending our Mechanical Engineering expertise to:

- Conveyor Design
- Crushing and Screening
- Bulk Materials Handling Systems
- Slurry System Design and Hydraulic Analysis
- Process Plant Design
- Ship Loaders
- Stackers and Reclaimers
- Comminution
- Gravity Separation
- Flotation
- Thickening and Clarifying
- Magnetic Separation

# Piping Engineering

- Chute Flow Improvement.

## Piping Engineering Consultants: Concepts, Analysis and Solutions

Engenium's experienced team develop concepts, undertake detailed analysis and provide design solutions and documentation in Piping Engineering, including:

- System Design
- Equipment Selection
- Piping Specifications
- Static Analysis
- Transient/Hammer Analysis
- Stress and Flexibility Analysis.

We have solid Piping Engineering Design experience in:

- In-Plant Slurry and Solution Pumping
- Tailings Systems
- Raw Water Systems
- De-Watering Systems
- Potable Water Plants
- Plant and Potable Water Distribution
- Waste Water Systems

**Client**  
Rio Tinto

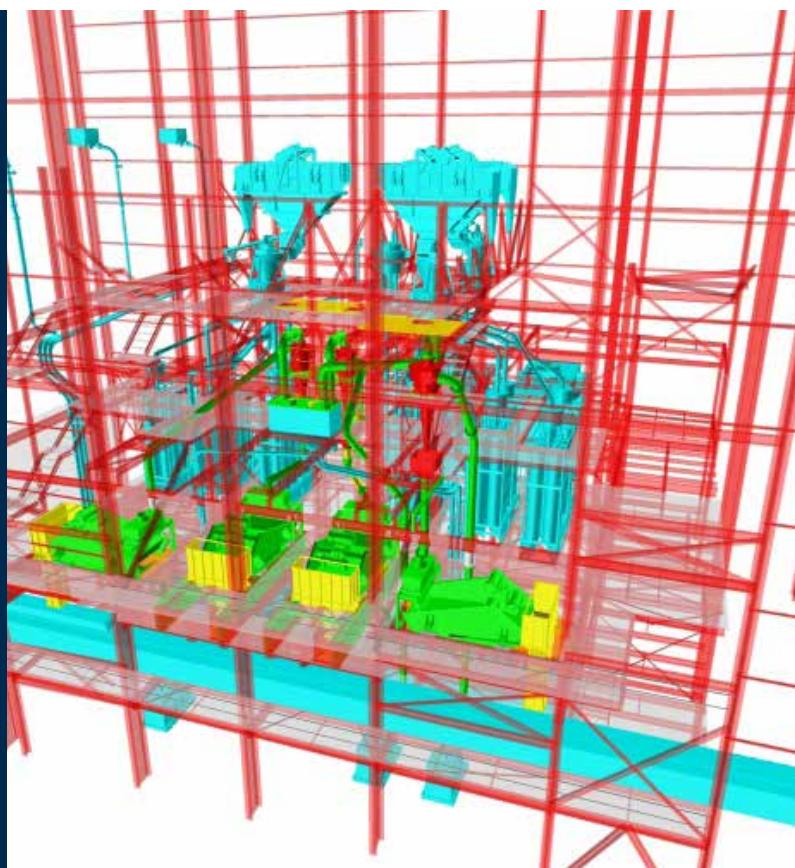
**Title of Project**  
Spirals Plant Upgrade

Engenium was engaged to undertake the debottlenecking study and upgrade at the Spirals Tails Dewatering Circuit at Tom Price.

The project driver was to increase the throughput of the plant and increase capacity of the Spirals Tail Dewatering Circuit.

Engenium initially undertook the preliminary design and developed process flow sheet and evaluated the feasibility of all improvement activities in terms of design, cost and schedule.

This led to detailed design of the project including the analysis of the existing building and structure, upgrade of cyclones, screens, piping and supporting structures and associated electrical and instrumentation.



# Structural Engineering

## Structural Engineers to the Resource and Industrial Infrastructure Sectors.

Engenium's expert team of Structural Engineers provide Consultation, Design, Construction and Rehabilitation of projects in the mining, resource and industrial infrastructure sectors.

At Engenium we will work as a team and objectively look at a structure to ensure it is strong enough to withstand natural forces and loads imposed by nature. We will carry out strength calculations and prepare drawings to ensure your project is structurally sound and will stand the test of time.

Our services cover everything from platforms, foundations, structural concrete, walkways and support structures for machinery and pipes to large storage bins, silos, conveyors and towers.

Engenium's Structural Engineers have worked on projects such as:

- Wet process plant buildings.
- Material handling structures.
- Bin, chutes, silos and tanks.
- Crane certification.
- Structural inspection and verification works
- Remote camps and expansions to working camps.
- Workshops, warehouses and maintenance facilities.
- Administration and EPCM office facilities.
- Security gatehouses and facilities.
- Remote airports and facilities.
- Port land-side infrastructure.
- Concrete and steel structures.
- Ammonium nitrate facilities.
- Fuel storage and distribution facilities.
- Rare earth and lithium process plants.
- Shop detailing.





# Industrial Infrastructure & Buildings

## Industrial Infrastructure Design and Construction Management.

We can manage your industrial infrastructure project from the strategic level and Feasibility Study stage through to Detailed Design, Documentation, Construction Management, Commissioning and Handover.

Key personnel within our business have worked on a significant number of major mine and industrial infrastructure projects in Australia and internationally. Our understanding of mine operations and cost structures enables us to deliver solutions that not only reduce your capital costs, but also ongoing operations and maintenance.

Our industrial infrastructure and buildings experience includes:

- Construction camp and village facilities (remote accommodation).
- Remote and reinjection borefields.
- Potable water pumping and distribution.
- Process/raw water pumping and distribution.
- Waste water treatment and management.
- Fire protection systems and fire water.
- Power generation, transmission and distribution.
- Lighting and public space design.
- Communication systems for remote sites.
- Roads, bulk earthworks and drainage.
- Concrete and steel structures.
- Airstrips.
- Administration offices and EPCM offices.
- Workshops and warehouses.
- Ammonium nitrate facilities.
- Fuel storage and distribution facilities.
- Security offices and site access systems.
- Security fencing and guard house.

Our Industrial Infrastructure capabilities include:

- Project execution strategy and management.
- Scope, budget and schedule management.
- Contracting and procurement strategy and management.
- Engineering management and design.
- Value engineering.
- Interface management, coordination and communications.
- Project controls and reporting.
- Risk management.
- Estimating and planning management.
- Construction management.
- Health, safety and environmental compliance.

# Civil Engineering

## Civil Engineering Consultants With Experience in Remote Areas.

Engenium has significant Civil Engineering experience in remote areas, such as the Pilbara region of Western Australia.

This valuable experience includes the delivery of Feasibility Level Engineering Studies, right through to Detailed Civil Engineering Design for the following:

- Bulk earthworks and civil works.
- Dewatering and borefields.
- Haul and access roads.
- Main road intersections.
- Pads and pipeline routes.
- Power and communications.
- Sediment ponds and dams.
- Stormwater drainage.
- Water and waste treatment.
- Remote airport infrastructure.
- Port landside infrastructure.
- Mine infrastructure.
- Camps and site buildings.





# Electrical Controls & Instrumentation

## Comprehensive Electrical Controls and Instrumentation Engineering.

Engenium provide comprehensive Electrical Controls and Instrumentation Engineering from the Study stage through to Detailed Design and Commissioning.

Our capabilities include:

- HV/LV system design.
- Electrical substations.
- Power generation, transmission and distribution.
- Switchboards and motor control centres.
- Electrical design and drafting such as block diagrams, schematics, general arrangements, IO and software lists, terminations, loop diagrams and single line drawings.
- Instrument and equipment lists and datasheets.
- Lighting and power design.
- Power system studies such as load flow, short circuit, harmonic analysis, motor starting, transient stability analysis, protection study, fault analytics and arc flash.
- Power factor correction.
- Earthing and lighting protection design.
- Programming integration for PLC, HMI, DCS, SIS and RTUs.
- Programming and integration of high availability safety systems, flow metering and monitoring.
- Advanced process control systems and high speed applications.
- Technical documentation such as software philosophies, functional specifications, acceptance testing, procedures, work instructions and training documents.
- Acceptance testing and validation.
- Control systems execution management.
- Remote operations.
- Hazardous area design and classification.
- HAZOP, CHAZOP and safety audits.

# Design Drafting

## Comprehensive Design Drafting Using the Latest Software

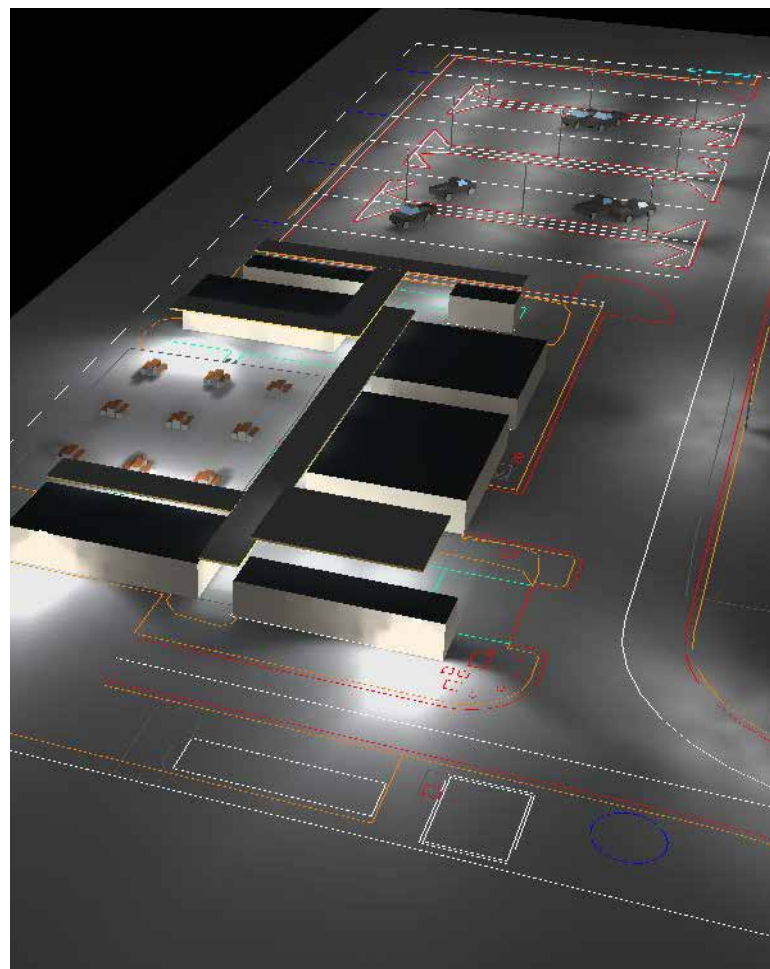
Utilising the latest in 3D CAD design software, BIM systems and laser scanning technology, Engenium offers a comprehensive Design Drafting service.

Our multi-disciplinary drafting team encompasses Civil, Structural, Mechanical, Piping, Process, Electrical and Instrumentation designers. We have significant experience in generating drawings and deliverables for fabrication in both Greenfield and Brownfield projects.

Engenium is committed to ensuring you receive cost effective deliverables without compromising on quality and deadlines.

Our Design Drafting service includes:

- 3D modelling.
- Shop fabrication detailing.
- Laser scan point cloud data manipulation.
- GIS, mapping and alignment plans.
- Fabrication Inspections.
- Multi-discipline drafting team.
- 3D CAD design reviews.
- Animations and walk-through's.
- 'As Built' back drafting.



# Rail Engineering

**Rail Engineering Consultants: Experts In Heavy Haul Rail.**

Engenium has an extensive history in heavy haul rail projects across the bulk commodities market in Australia and internationally. We have built a strong reputation in Rail Engineering having undertaken Rail Project Delivery services globally for blue-chip miners, government organisations and emerging resource companies.

Engenium manages Rail Infrastructure projects from the strategic level and Feasibility Study stage through to Detailed Design, Documentation, Construction Management Commissioning and Handover. Our understanding of rail operations, rail systems and cost structures enables us to deliver solutions that not only reduce capital costs, but also ongoing operations and maintenance.

Engenium has been involved in the successful delivery of over \$8bn of Heavy Haul Rail projects, demonstrating a depth of experience and expertise in this sector.

## **Rail Project Delivery Experts**

Engenium has an extensive history in heavy haul rail projects across the bulk commodities market in Australia.

Our Rail Project Delivery experience includes:

- Heavy haul rail and transportation
- Roads, fills and cut throughs

- Transport intersections
- Bridges
- Culverts and drainage
- Earthworks and civil works
- Electrical Design
- Signalling Design
- Communications

We utilise recognised industry leaders, reliable systems and procedures, train simulation and modelling to ensure that the best logistical solutions are considered and presented to you. Where a niche skill is needed, we use a network of highly skilled individuals and companies to supplement what we have internally.

## **Our Rail Project Delivery capabilities include:**

- Logistics Studies
- Determination of Development Paths
- Development and Evaluation of Logistics Solutions
- Value Engineering and trade off Studies
- Risk Analysis
- Capital and Operating Cost Estimates
- Peer Reviews
- Inspect and Report on an existing infrastructure
- Third Party Access
- Contractual Agreements
- Operating Contract Negotiation
- Project Development

## **Client**

Société des Mines de Fer De Guinée (SMFG)

## **Title of Project**

Nima Iron Ore Selection Phase Study Peer Review

Engenium was engaged to provide peer review services for a proposed railway solution for SMFG, transporting iron ore from its proposed Nimba iron ore mine in Guinea, West Africa, to a suitable port.

The report not only reviewed the work that had been done but provided context around the risks, opportunities and a path forward for the project.

The client was looking to receive confirmation of the suitability of the rail design work and a path moving forward.

The peer review report provided the client with a level of confidence on the work that had been done and independently advised on the gaps that remained.





# Automation

Engenium is a leading supplier of versatile automation solutions across a wide range of production requirements.

We are specifically involved in automated product handling, batching, packaging, palletising and industrial safety applications. We also have extensive experience at production line relocation, including:

- Material handling, including powders, cereals, plastics, sugar and dried fruit
- Loose cereal blending and batching
- Packaging and palletising systems
- Industrial robot applications
- Vacuum conveying
- Systems integration for Piab Vacuum Conveying Systems
- Systems integration and system partner for Kuka Industrial Robots.

Our systems integration experience ensures we provide you with a partnered approach to automation projects. We will utilise your preferred equipment and work closely with all your stakeholders throughout the entire project.

Our vacuum conveying testing facility enables us to test products under simulated production conditions. We will provide written result opinions regarding transfer rates, bridging, fines generation and product degradation.

Our materials handling and vacuum conveying experience is often part of automated batching and blending applications in all ranges of products and throughput rates.

In addition, Engenium EMA has considerable experience in all forms of bagging, packaging and palletising, including the use of robots.

Past Clients Include:

- Toll Intermodal
- SPF Diana
- Donaldson (Australasia)
- Sugar Australia
- Kelloggs Australia
- Tip Top
- Greens General Foods
- Sanitarium
- Specialty Cereals
- Victoria Carpets
- Sauers Bakehouse
- Newly Weds Foods





# Safety In Design

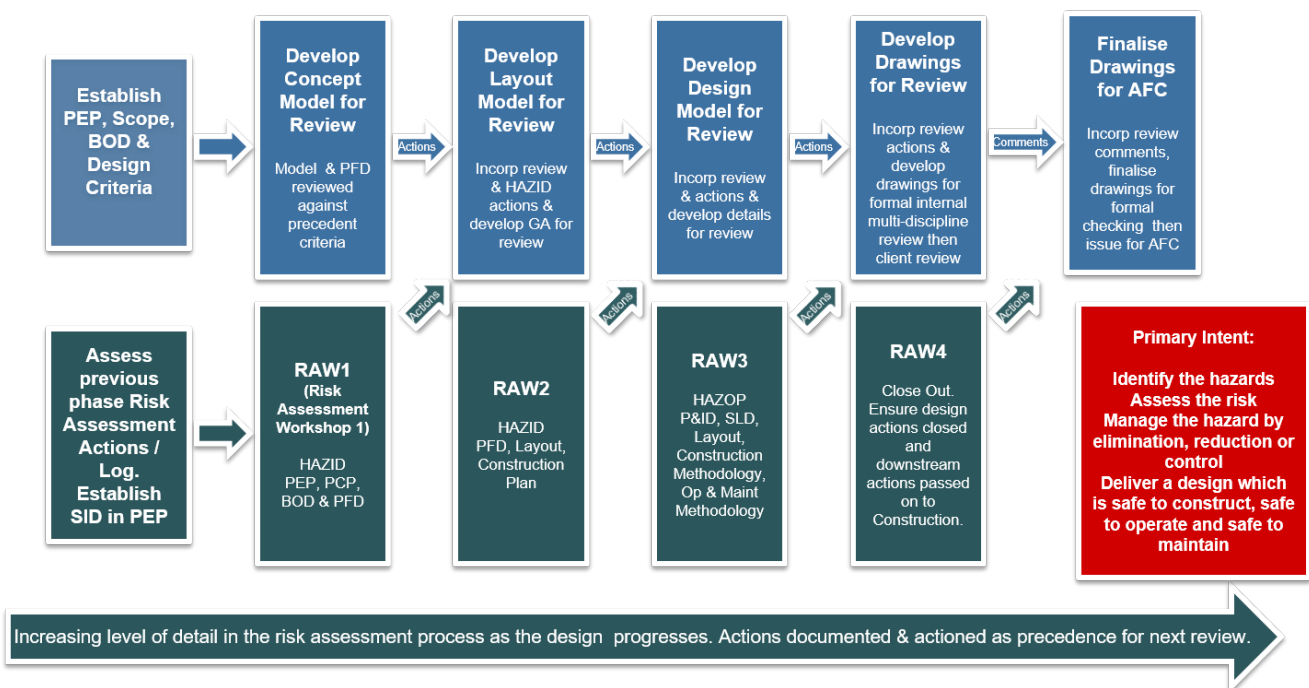
Engenium embraces Safety in Design principles and practise on all its projects, in accordance with legislative and regulatory requirements.

The OS&H Regulations specify the requirements of the 'designer' in relation to hazard identification, risk assessment and reporting. The EM/Leads refer to requirements of the OS&H Regulations local to where the works are intended to be constructed.

Safety in Design includes the safety culture of the design team, individual risk assessments, as well as the formal systems, reviews and documentation developed during a project.

Safety in Design is focussed on delivering a design which is safe to construct, safe to operate, safe to maintain and complies with all the Acts, Regulations and Standards applicable to the work and the site.

## ENGENIUM DESIGN / SID METHODOLOGY



### Client

IMX Resources

### Title of Project

Snaefell Magnetite Deposit

### Capital Value

~AU \$1.5 Billion

Engenium was asked to provide a concept study report encompassing design, engineering and procurement to assist in preliminary project evaluation. IMX identified a scope for two production options of 4.7 Mtpa and 9.4 Mtpa.

Engenium developed an operating cost estimate, as well as a +50%/-15% capital cost estimate which included conceptual process flowsheet, mechanical equipment list, relevant site buildings, power supply, conceptual borefield, tailings storage facility and camp.



