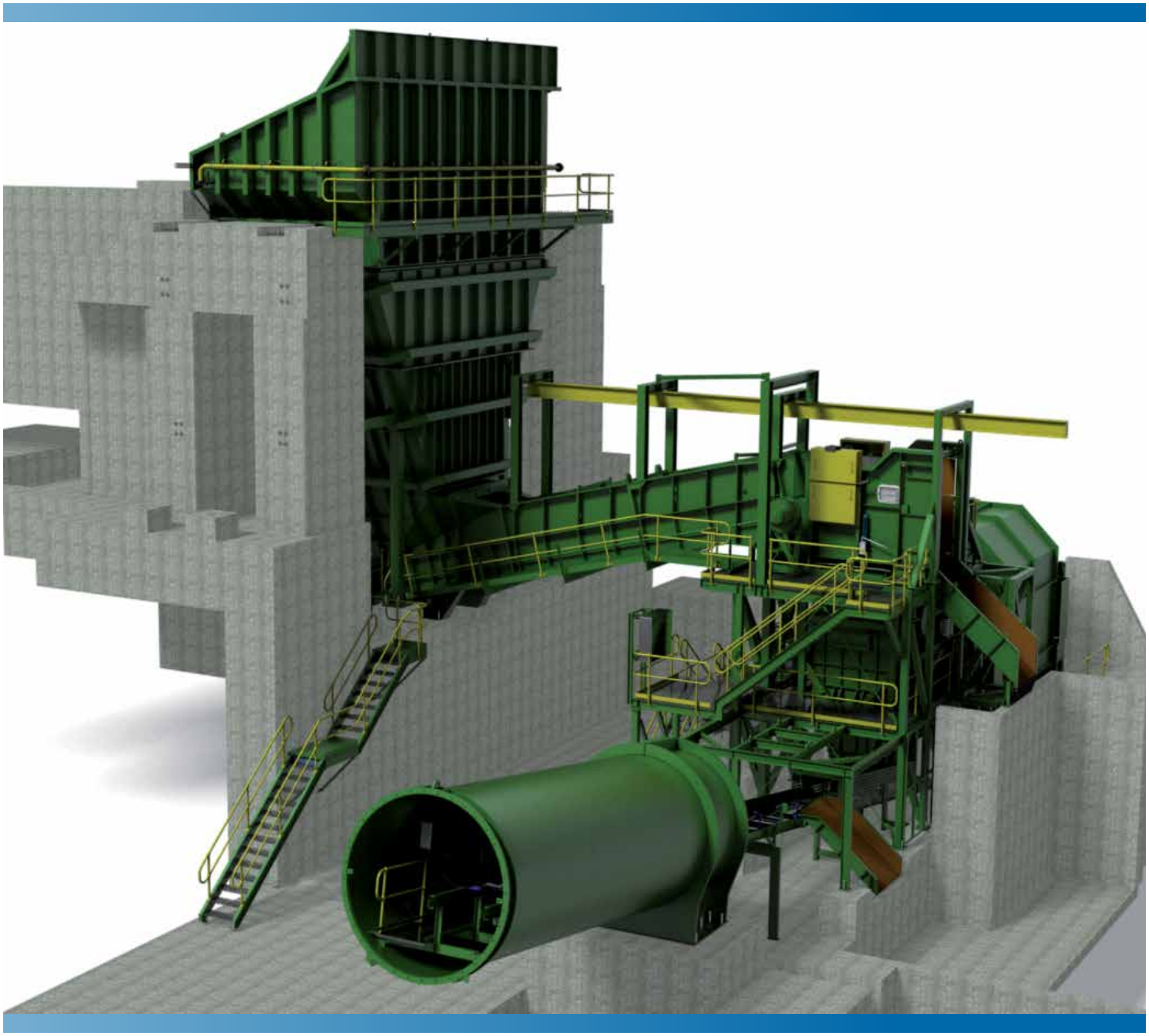
Brightwater

Engineering Design Capability Statement

YOUR ENGINEERING PARTNER



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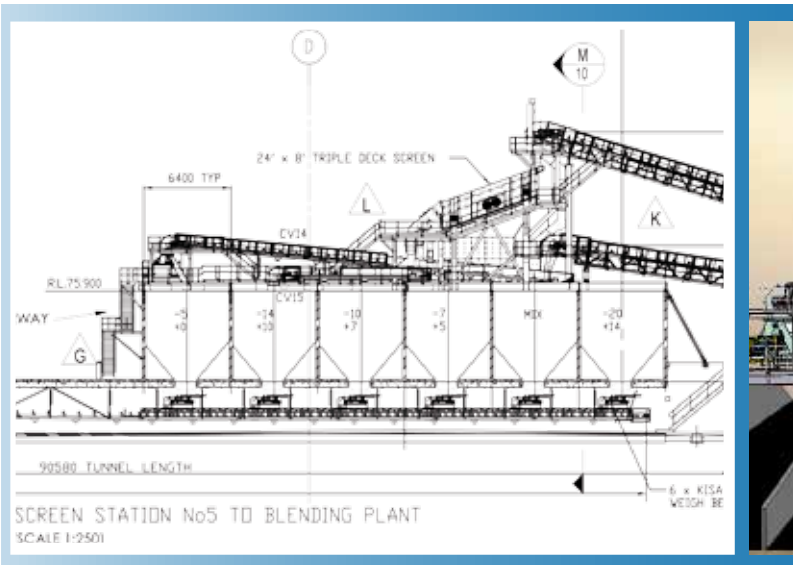

Minimise risk and ensure your project's success by selecting an experienced team utilising the latest technology to deliver fit for purpose design solutions.

The foundation of every design project we undertake is our commitment to deliver fit for purpose engineering that reduces design time and accelerates our client's project development through to the completed result. We achieve this through close collaboration with our clients and stringent design processes that produce high quality, cost effective professional engineering design services from initial concept through to shop drawings.

Collaboration

Whether it's a large greenfield project or upgrading an existing plant or process, our collaborative approach ensures all our clients are included in the decision making process at every stage of the project. This close partnership produces the best design solution and leads to faster implementation of technology solutions at an optimal cost. Other benefits of this approach include:

- Clear and precise scope boundaries by quantifying and justifying the investment required for a given benefit
- Fewer scope changes and more fluid management of change
- Identification of project risks early in the design phase so actions can be taken to mitigate their impact

Multi-Disciplined Engineering Design

We offer professional in-house design across all facets of engineering including Mechanical, Electrical, Control & Automation, Civil and Structural. This complete service produces efficiencies through a seamless integrated design resulting in a more cost effective package for our clients. Our qualified engineers and designers have an array of expertise delivering proven results from design software and tools including:

Mechanical

- Solidworks Premium 3D Design
- AutoCAD 2D Design

Electrical

- Accredited Rockwell Automation PLC software system integrator
- Schneider Electrical Alliance Partner
- SCADA software

Industry Sectors

Our professional engineering design experience and expertise covers a wide range of industry sectors including:

- Mining & Minerals
- Bulk Materials Handing
- Quarry & Aggregates
- Port Installations
- Wood Processing
- Water Treatment
- Energy & Fuel Handling

QA System & Checks

All engineering design undertaken by Brightwater is assured by utilising well defined and documented processes throughout the design phase including:

- Documenting Basis of Design (BOD) with client input and verification
- Defining and verifying design input requirements and output specifications through fit for purpose documentation such as; scopes of work, equipment specifications, and equipment data sheets
- Regular design reviews throughout the design development stage
- Engineering & shop fabrication drawings adhering to a defined drafting standard
- Rigorous drawing check procedures followed to ensure the quality of finished product

Our Approach to Safety

Zero Harm is a core value of Brightwater's and the Health & Safety of our staff is paramount. Having significant experience in undertaking large and small scale projects has given Brightwater the internal structure, processes and support staff in order to create a strong Health & Safety culture and performance.

All work carried out by Brightwater is done in accordance with our stringent H&S policies and monitored by our Health & Safety Advisor. Our safety record translates into lower insurance and liability rates, therefore reduced costs and risks to our clients.

ZERØHARM
ALL ACCIDENTS ARE PREVENTABLE

About Brightwater

Brightwater is proudly named after the regional Nelson town where we have been located since our inception in 1979. From the very beginning our core purpose has been to truly understand our client's requirements and through a collaborative partnership provide fit for purpose industrial engineering solutions.

Specialising in industrial bulk materials handling, our in-house capability allows us to provide a complete range of services from engineering & design through to fabrication, site maintenance and installation. Our multi-disciplined projects team has delivered significant brownfield upgrades and greenfield projects throughout Australasia in the Mining, Quarry, Resources, Water Treatment, Dairy and Wood Processing sectors.

With large workshops in Nelson and Greymouth, we have a significant trade workforce that provides a full range of fabrication services as well as onsite installation, repairs and maintenance work.

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Engineering Design Process

The engineering design process is flexible and adapted to meet client's individual requirements and the size or complexity of any given project, however the following process is an example of a typical design process that may be followed for a significant project:

Concept Development

1

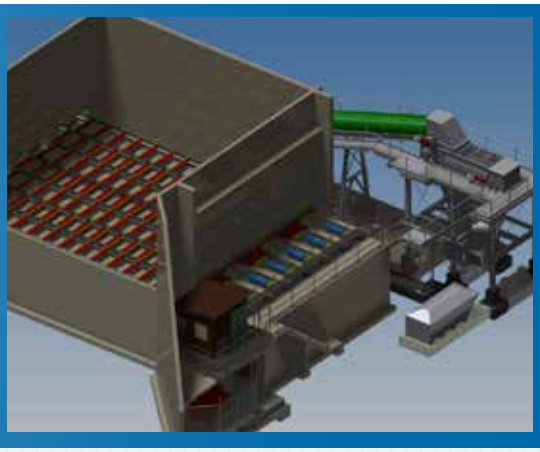
- Process Optimization
- Plant layout Options
- Process Flow Diagrams
- Indicative Capital Cost Estimates
- Capital vs. Operational Cost Analysis
- 3D Project /Design Visualisations
- Environmental/ Resource Consent Implications

Feasibility Studies

2

- Engineering & Process Design Analysis
- Plant Layout General Arrangements (2D & 3D)
- High Level Engineering Design
- Engineering drawings
- Proprietary Equipment Selection
- Equipment Lists
- Power Supply Requirements
- Civil, Structural & Service Requirements
- Functional Descriptions
- Control & Automation Options
- Site Geotech Analysis
- Detailed Economic Analysis
- Captial Budget Estimating
- Resource Consent Application Support

Brightwater Engineering Design Flow


Detailed Design

3

- Basis of Design Created & Approved
- Lead Engineer & Design Team Selected
- Finalise General Arrangements, Process Flow Diagrams & Piping/Instrument Diagrams
- Create an Interactive Project Model
- Define all Design Elements
- Engineering Calculations and Analysis
- Design Development Specifying Scope for all Design Elements
- Design Process Controls, Automation & SCADA
- Create Lists/Schedules for Equipment, Piping, Instruments, Cables, and Motors etc.
- Specifications for, and Evaluation of, Proprietary Equipment for Procurement.
- Electrical Supply & Service Reticulation Design
- Mechanical equipment Modeling & Design Review
- Manufacturing Drawings & Bills of Materials
- Civil Drawings for Foundations, Concrete Works, Buildings, Infrastructure, Drainage & Roading etc.
- Hazard & Operability Studies (HAZOP)
- Statutory Certification & Producer Statements
- Document Management & Control

Manufacturing and Installation

4

- Engineering Advise for Manufacturing
- Engineering Supervision
- Installation Drawings & Methodology
- Installation Bills of Materials
- Lifting Plans
- Electrical Testing & Certification
- Structural Certification
- Safety & Hazard Audits

Finalise Documentation

5

- Operations Manuals
- Maintenance Manuals
- As Built Drawings
- Document Archiving

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Project Examples

Higgins Meremere Plant Upgrade

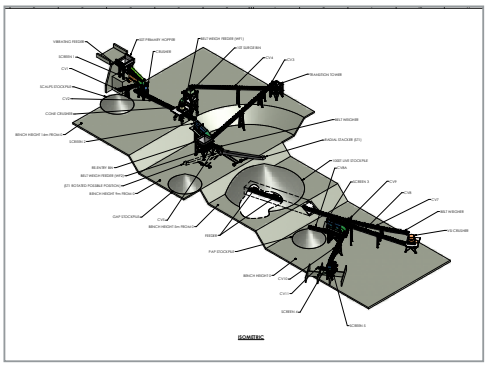
Overview:

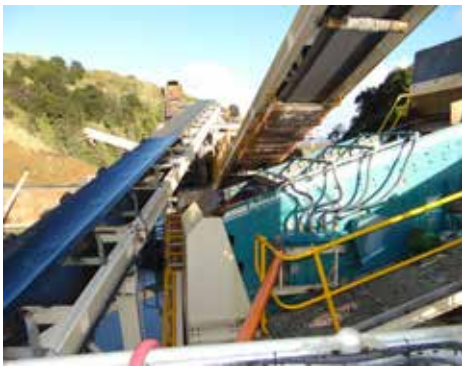
Higgins Aggregates supplies over two million tonnes of aggregates per year throughout New Zealand. Located near Te Kauwhata in the Waikato, Higgins Meremere Quarry supplies high PSV aggregates to the road construction industry. In an initiative by the company to drive greater efficiencies, the Meremere Quarry was required to undergo a transformation from diesel powered mobile equipment to a new fully electric fixed plant.

Solution:

Brightwater was contracted to design, manufacture and install a purpose built fully electric plant that utilised existing tracked mobile equipment on site to help reduce costs. The Design was a joint collaboration between Brightwater and Higgins. Brightwater completed a high level concept sketch and used three dimensional modelling to capture and communicate the most efficient solution given the challenging topography of the quarry site.
The result of this design lead to a modular plant where mobile equipment was fixed into position, extra conveyors were added along with larger more efficient screening plant. The design increased production from approximately 60 tonne per hour up to 180 tonne per hour capacity.

A new elevated feed bin was also designed to allow 30 tonne dump trucks to provide continuous feed material into the plant at a set rate.
The entire process from design concept to site installation and commissioning was completed within an eight month time frame.





NPIL Line 1 Outfeed Deck

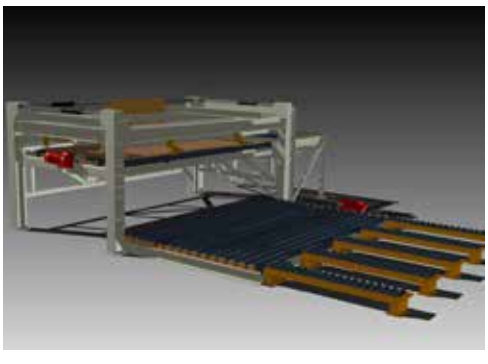
Overview:

Nelson Pine Industries Ltd engaged Brightwater to design and supply a new outfeed stacking deck for their Line 1 MDF press to handle larger pack sizes. The MDF press produces a range of MDF products in different thicknesses and sizes and the finished sheets must be stacked, squared and fed out without any slowing or stopping of the press.

Solution:

Due to space constraints and the requirement to handle the larger pack size, the stacking deck design had to be completely different to the existing stacking deck. The new stacking deck that was designed included automated variable side alignment rams to allow for board sizes ranging from 3m to 5.1m. Quick acting lifting deck driven off a single hydraulic ram able to raise and lower the deck within 6 seconds and driven outfeed decks capable of feeding out a complete pack within 10 seconds.

The brief was to design a new stacking deck capable of handling board packs up to 1.35m thick which would reduce forklift movements on site. Brightwater achieved this with the design but also managed to produce a stacking deck significantly simpler in operation to the existing with fewer moving parts and which took up a smaller footprint on site. The quality of design meant the both the fabrication and installation went together smoothly with zero rework required on site.



Project Examples

Stockton Coal Handling & Processing Plant

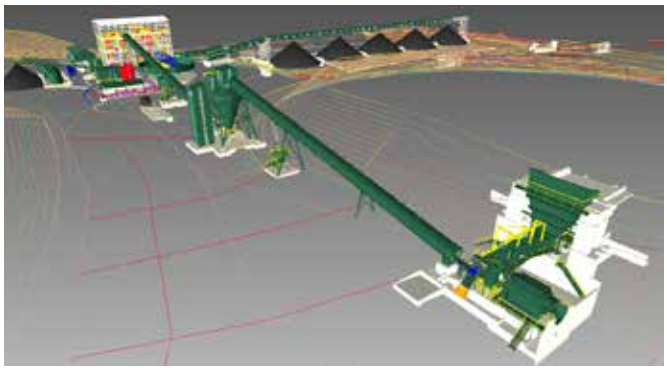
Overview:

Solid Energy New Zealand operates an open-cast coal mine on the Stockton Plateau, 35km north of Westport, on the West Coast of the South Island, New Zealand. The Stockton mine produces high-quality coal for export to the steelmaking industry. In 2008 Solid Energy New Zealand engaged Brightwater as the head contractor to design, procure, and manage fabrication and construction of the green-fields Coal Handling and Processing Plant project, all within a fast-track schedule.

Solution:

Brightwater's Design team's contribution was the design of the Coal Handling Plant (CHP) to support the Coal Preparation Plant (CPP) in-feed and product out-feed. This comprised of a ROM station with rotary breaker, two feed conveyors, a surge bin, thickener (for CPP), and four product stockpile conveyors.

A key design challenge was the high wind speeds at the Stockton site which would result in high loadings on conveyor truss sections of rectangular profile. Brightwater designed totally enclosed circular cross-section conveyors, with a resultant drag force coefficient 40% lower than those of the rectangular type. The site layout also called for long conveyor spans; traditionally square gallery style conveyors would be specified but the required size and leg spacing proved costly. Brightwater's innovation was the introduction of tubular gallery sections for the CPP feed conveyors, which offered significant cost savings to the client. A new elevated feed bin was also designed to allow 30 tonne dump trucks to provide continuous feed material into the plant at a set rate.
The entire process from design concept to site installation and commissioning was completed within an eight month time frame.



Tekapo Canal Gravel Feeder

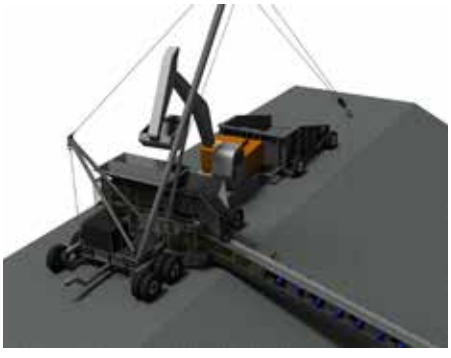
Overview:

Fulton Hogan (FH) were awarded a contract to repair and reline the Tekapo Canal. This project required a new replacement liner to be placed through a seven kilometre section of canal that had been leaking water. As a part of replacing the liner, FH's scope of work required 20-200mm river run rock (AP 200-20 MM0) to be placed on top of a 10mm thick geotextile mat that directly covered the 2.5 mm thick geo-composite PVC membrane liner. This placement of the rock acts as ballast to keep the liner firmly located on the base and inverts of the canal.

The challenge for Fulton Hogan was to deliver this ballast material from the top section of the invert, which was several metres higher than the canal floor and the deliver the ballast 25 metres out into the centre of the canal floor. This had to be accomplished whilst ensuring the newly laid PVC canal floor was not damaged in the process.

Solution:

The Brightwater Design team worked closely with Fulton Hogan's operational staff to develop several engineered solutions before settling on a combination of newly applied technologies and proven mobile plant technologies. The process created was a Gravel Feeder mobile machine that accepted 30 tonne payloads from articulated dump trucks into a specifically designed steel constructed mobile bin. The product was then retrieved from the bin via a 20 tonne excavator and delivered into a hopper located on a specifically designed trailer mounted hopper. The hopper then fed the product directly onto a belt feeder conveyor in turn delivering the product onto a declining conveyor down to the centre of the canal floor. The process created a delivery rate of 2000 tonnes per day.



Nelson

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