Brightwater
ENGINEERING

Wyndhamvale Quarry Plant

PROJECT REPORT

CLIENT: THE BARRO GROUP, AUSTRALIA

INNOVATIVE SOLUTIONS TO INDUSTRY

CONCEPT DESIGN MANUFACTURE INSTALL COMMISSION OPERATE

The Situation

Barro Group are one of the largest privately owned aggregates and concrete manufacturing companies in Australia. Their existing quarry at Wyndhamvale, 35km South West of Melbourne had been crushing aggregates using mobile equipment. Due to significant local growth in the Wyndhamvale area, the existing operation was identified as unable to meet the increasing demand for aggregates. This demand for aggregate products inspired Barro to build a new fixed plant, in the existing quarry, capable of an output of 600t/hr of either blended or washed aggregates.

Barro's brief to Brightwater Engineering was to deliver an industry leading processing plant to meet Barro's increased throughput requirements. The project was to have the highest standards in terms of HS&E plus, through good design, deliver safe operational and maintenance access throughout the finished plant.

Additionally, Brightwater Engineering was challenged to design a plant that could be fully relocated if required.

The Solution

Brightwater Engineering's design team of some 40 engineers and draftsmen were assigned to deliver the Front End Engineering and Design (FEED) stage that enabled Brightwater Engineering to refine design requirements from the client's specifications, develop preliminary layouts and a Basis of Design document.

Brightwater Engineering worked closely with Barro throughout the FEED to ensure that we delivered a finished product which met all our client's expectations. This FEED phase allowed Brightwater Engineering to gain valuable feedback from experienced individuals within Barro on specific items such as operational and maintenance access requirements around such equipment as Crushers and Screens.

Approximately 80% of all the steelwork in the project was fabricated in our Nelson, Christchurch and Greymouth facilities. Tight controls were needed to ensure all components where fabricated and delivered to site.

The site construction phase of the project had the large task of final assembly and erecting all the many components of the crushing plant. A high degree of site organisational and prioritisation was required to complete this task both safely and efficiently. A philosophy of using common design components meant the conveyors and structures assembly phase was extremely efficient, resulting in only minor adjustments being required to belts and chutes during commissioning.

The Benefits

Safety at work: Constant focus on Zero Harm throughout all project phases produced good results for all stakeholders.

Greater throughput: The plant can produce 600t/hr of finished product, which greatly increases the current output achieved by the mobile plant

Excellent access: Operational and maintenance access to equipment is of a very high standard and raises the bar for the Quarry sector. Special attention was given to safe access throughout the plant, through a process of consultation, 3D design reviews and HAZOPs.

Tunnels have excellent operational and maintenance access, where conveyors are suspended from the roof to improve clean out access.

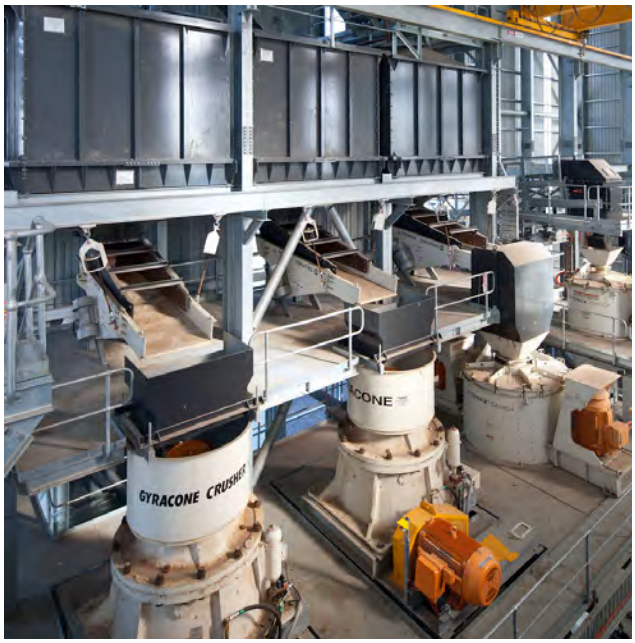
Flexibility of products: The plant can deliver blended aggregates or washed aggregates.

Common components: Common components for conveyors such as pulleys, trusses and take-up units allow for efficient fabrication, reduced design and installation costs.

Relocatable: The plant is designed to be readily movable, with bolted rather than welded assemblies. This allows Barro to have the plant dismantled in the future for relocation and reconstruction elsewhere.

The Specifications

- 600t/hr aggregate crushing plant with a recirculation capacity of 1300t/hr
- Conveyors – 41 with a combined length of 1.6km
- Longest single conveyor - 126m
- Radial stacker - 35m
- Primary Station capacity - 750t/hr maximum rock size 750mm
- Secondary and Tertairy Crushing building 30m x 15m x 18m high
- Screening Stations - 5
- Blending Station with 120t spilt Silo
- Surge Pile reclaim tunnel 77m long
- Aggregate bin reclaim tunnel 90m long
- Scalping capacity 350t/hr @ minus 40mm
- Blending capacity 600t/hr @ minus 20mm to minus 5mm
- Washed Aggregate capacity 600t/hr @ minus 20mm fines
- Fastest belt speed 1.92m/s
- Largest Gearmotor – 110kw



Construction Statistics

Erected Steel - 1200t

Site crew - 18 men at peak

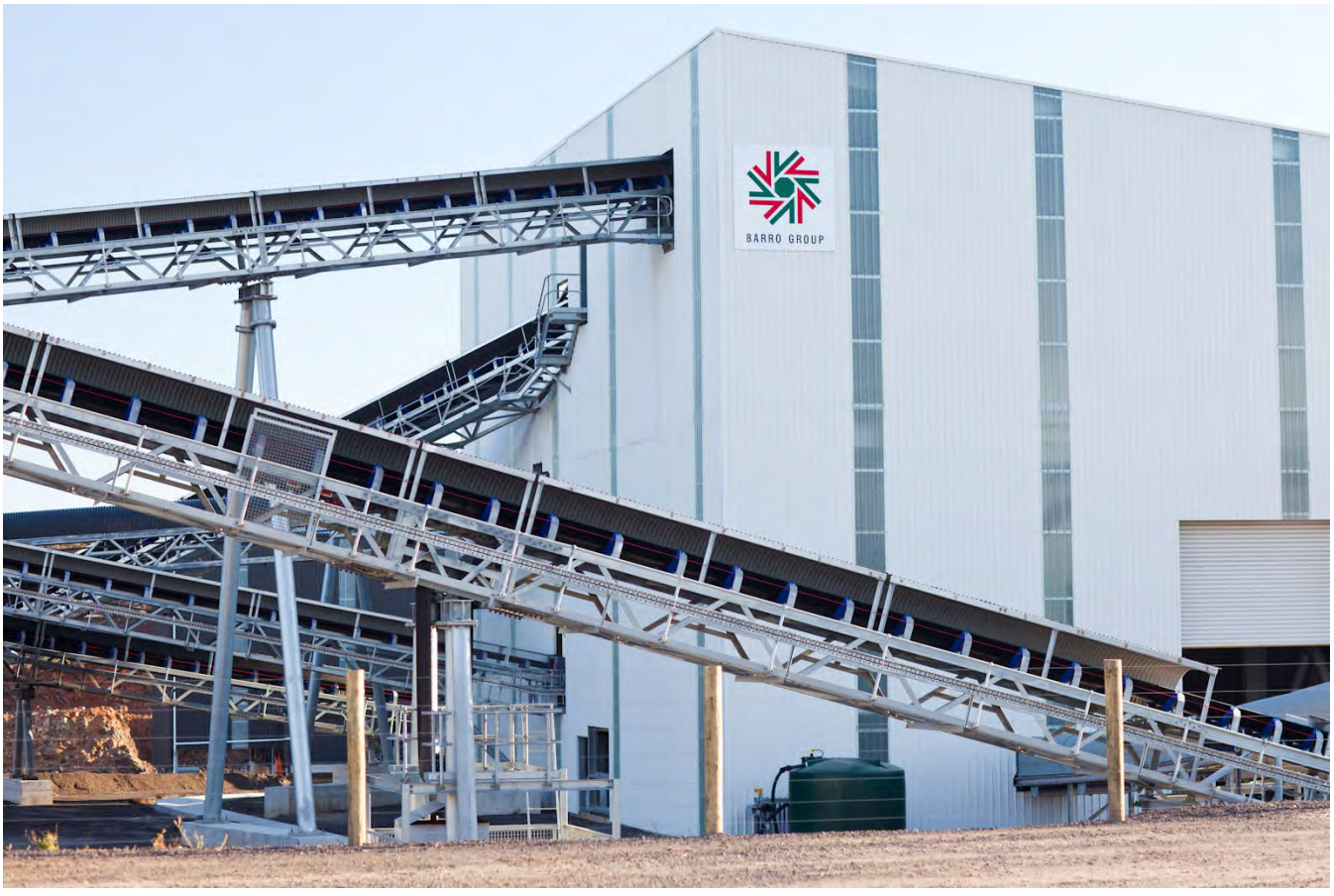
Site erection - 10 months

Largest crane used - 180t

Largest single lift - 28t

Total site man hours - 26,000

LTIs - 1



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