LANKA TILES LIMITED

Separation of Large Raw Material Particles and Installation of Additional Jaw Crusher for Large Particles to Increase Crusher throughput

SUMMARY OF THE OPTION

Lanka Tiles is a ceramic-based floor tile manufacturing company in Sri Lanka. Regular peaks in electricity consumption combined with regular jamming of the jaw crusher with large particles were observed. To solve this problem, large particles are broken into smaller particles before they enter the material hopper and an additional jaw crusher was installed to further reduce particle sizes. These modifications cost US$ 50,000. Specific power consumption was reduced from 60 to 39 Rupees per ton of product, which equated to 36,000 kWh or US$ 3,600 for the year 2004. The payback period was 14 months. GHG emissions were reduced with 7 tons CO2 per year. In addition, material throughput increased from 3 to 5.5 tons per hour and therefore tile production was increased.

KEYWORDS

Ceramics, Sri Lanka, Crusher, Raw materials

OBSERVATIONS

The main raw materials in ceramic-based tiles production are feldspar and dolomite. These raw materials are transported from remote quarries and temporarily stored at the site before used in the process. The particle size of raw materials ranges from 450 mm to very fine particles, and must be reduced to less than 5 mm before the ball milling stage. Particles are reduced in size in a series of crushers, screens and hammer mill as shown in figure 1.

The Team observed regular peaks in the energy consumption of the crushing system and low material throughput of 3 tons per hour. Upon investigation the cause was found to be frequent jamming of bulk particles in jaw crushers.

OPTIONS

The following options were selected and implemented after completion of a financial and technical feasibility analysis and shown in figure 2:

- Segregation of large size bulk particle materials and breaking them into smaller pieces prior to feeding into the material hopper
- Installation of an additional jaw crusher to break the large particles into smaller pieces

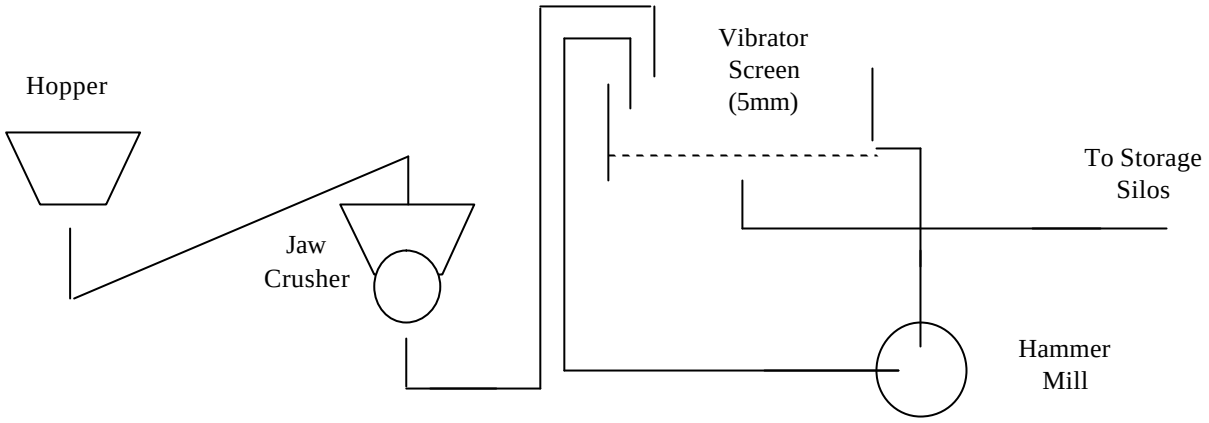

Figure 1. Material Preparation (Previous Arrangement)

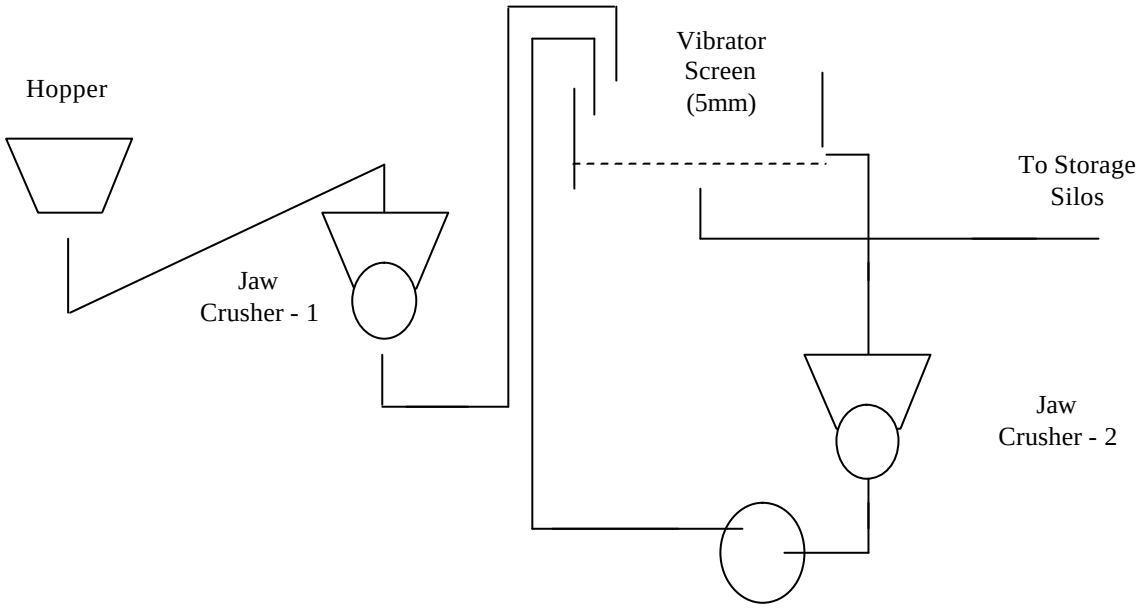

Figure 2.Material Preparation (Present Arrangement)

RESULTS

As a result of these modifications, material throughput was increased and specific energy consumption was reduced:

	Before	After
Material throughput (tons / hour)	3	5.5
Specific electricity costs (Rupees / ton product)	60	39

Financial benefits:

- Investment: US$ 5,000
- Annual cost savings: US$ 3,600 (from electricity savings, excluding production increases)
- Payback period: 14 months

Environmental benefits:

- Annual electricity savings: 36,000 kWh
- Annual GHG emission reductions: 7 ton CO_2 (36 MW * 0.205 ton CO2/MW)

Other benefits:

- Increased production (not quantified)
- Noise reduction because smaller particles enter the crushers and jammers, contributing to an improved working environment
- The Team identified that particle segregation could also be implemented at the feeding stage of the process

FOR MORE INFORMATION

GERIAP National Focal Point of Sri Lanka
Mr. Nihal Cooray
Manager, Small and Medium Enterprise Developers (SMED)
Level 4, No. 53, Vauxhall Lane
Colombo 02, Sri Lanka
Tel: +94 1 304287, Fax: +94 1 304291
E-mail: projsmed@slt.lk; geriapsl@sltnet.lk

GERIAP Company Sri Lanka
Mr. Upali Dissanayake
Works manager
Lanka Tiles Limited
St. James Estate
Jalthara, Ranala
Sri Lanka