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Aggregates for concrete in Nigeria

Case Study

A Nigerian quarry operator produces aggregates for use in road base, concrete and asphalt from granite.

This operator has a original two stage crushing plant which consists of a primary (600×900mm) 24×36”jaw crusher, two secondary (300×1300mm) 12×51” finer jaw crusher.

The most popularly required sizes of aggregate in the market are 0~3/16” (stone dust), 3/16~1/2”, 1/2~3/4” and 3/4~1”. In this fines requirement, the operator only get 60~70 tons of aggregate per hour. The existing crushing plant is unable to meet the increasing demand on the aggregate with fines requirement and today’s increasingly high standard on aggregate shape.

This operator contacts with our company and hope to expand his quarry.

Solution

According to this operator’s requirement on fines and aggregate shape, our company designs a three stage crushing plant which consists of a primary (900×1200mm) 36×48” jaw crusher, one secondary S51” cone crusher (standard type), and one S51” cone crusher (short head type) in the tertiary section.

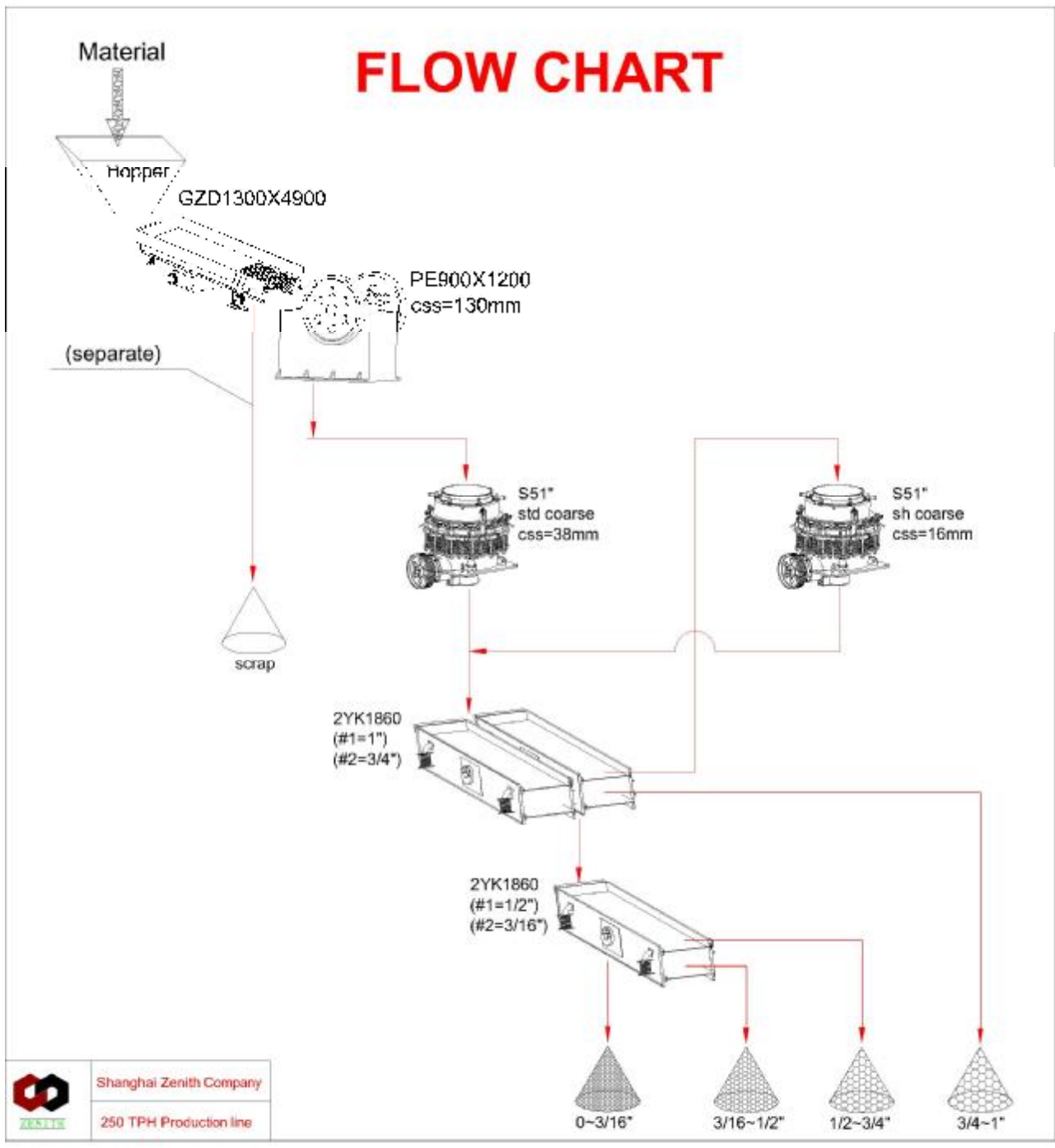
From this crushing plant, the operator can get a capacity of 240~260tph of aggregate



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with 0~3/16" (stone dust), 3/16~1/2", 1/2~3/4" and 3/4~1" sizes

Flow chart for this crushing plant





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Benefit and Advantage

Bigger capacity

Because of the application of tertiary cone crusher with short head type, the client can get bigger capacity of aggregate with 3/16~1/2" and 1/2~3/4" sizes (the percentage can reach to 76% in all aggregate), the price for aggregate with these two sizes are higher in the market, so the client can get bigger profit from this stone crushing plant

Good shape

The aggregate produced by jaw crusher doesn't have good shape, the percentage of aggregate with elongation and flakiness shape is about 33~38%, so the operator unable to obtain a good price in the market. When this new crushing plant put into production, the client get aggregate with good shape, the percentage of aggregate with elongation and flakiness shape is only 11~13%. Because of the good quality of aggregate, this client becomes the preferred aggregate supplier in local market.

Easy installation

Because of this client also purchased a complete set steel supporting structure for each equipment, so the installation for whole crushing plant become easy. Comparing with crushing plant which built on the concrete supporting structure, the installation period for the crushing plant with steel supporting structure reduces about 20 working days.

Considering the cost for concrete and labor in Nigeria, actually, the investment for



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steel supporting structure is more cost-efficient than the concrete supporting structure.

Conclusion

From this new crushing plant, the quarry operator can get bigger capacity of aggregate with fine size and good shape comparing with the original crushing plant, it means that he can get bigger profit from the new crushing plant in the same manufacturing cost for aggregate.